

## **APPENDIX-6**

### **物理探査**

## A.6.1 調査概要

### A6.1.1 MT 法探査

#### (1) 探査原理

MT(Magneto-Telluric)法は、磁気センサと電気センサで自然の地磁気と地電流を観測して地下深部の地下構造を探査する電磁探査法である。MT 法は深さ 10000 m 以上の探査が可能である。

MT 法は地磁気-地電流法ともよばれ、地球の磁場(地磁気)の変化によって地中に生じる地電流を用いる探査法である(図 A.6.1)。地磁気の変化は自然に生じているもので、太陽の活動に関連する 1 Hz 以下の地磁気脈動と、遠方の雷によって生じる 1Hz 以上の地磁気変動が原因と考えられている。MT 法では 0.001~1000 Hz 程度の周波数帯での観測を行う。ノイズレベルの低い夜間に 1 晩かけて観測を行うことが一般的である。調査範囲から 50 km 以上離れた場所の固定観測点(リファレンス点)の観測結果を用いて、測点周辺のノイズを除去する方法をリモートリファレンス方式とよぶ。

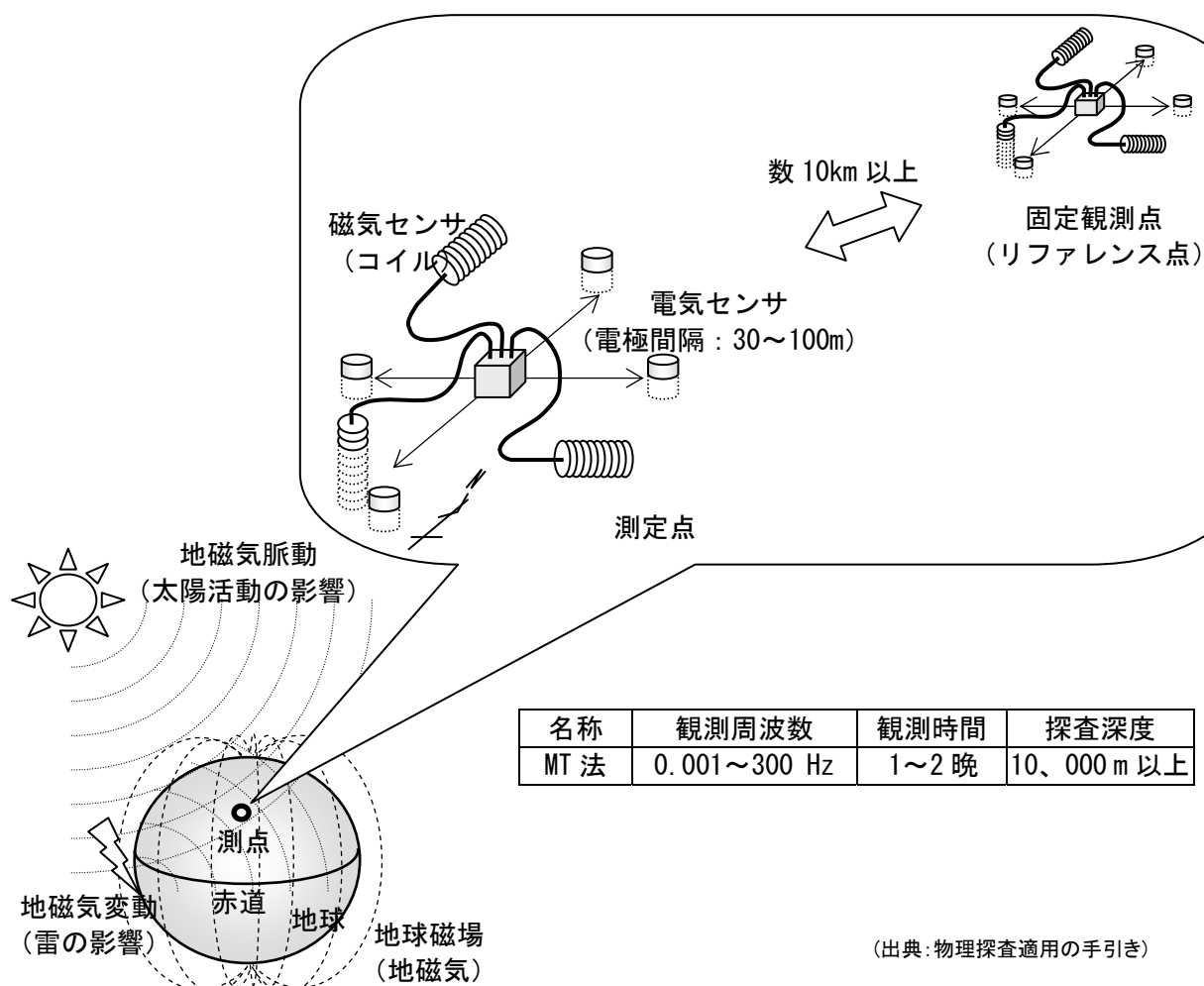


図 A.6.1 MT 法の測定原理・測定模式図

電磁波が大地に入射し地下深部に浸透していくと、電磁波のエネルギーは減衰する。MT 法では、エネルギー強度が地表の  $1/e$  (約 0.37 倍) になる表皮深度 (m) を探査深度の目安とする。表皮深度  $\delta$  は大地の比抵抗  $\rho$  ( $\Omega \cdot m$ ) と電磁波の周波数  $f$  (Hz) に依存し、次式によって表される。

$$\delta = \sqrt{\frac{\rho}{\pi f \mu}} \cong 503 \sqrt{\frac{\rho}{f}}$$

ここで、 $\mu$  は透磁率

上式より電磁場の周波数が低いほど、大地の比抵抗が高いほど MT 法の探査深度は大きくなることわかる。300~0.001Hz 程度の周波数帯域を測定する MT 法では、大地の比抵抗が  $10\Omega \cdot m$  であれば表皮深度は約 92m~約 50km となる。MT 法の探査深度は表皮深度の 2-1/2 ( $\cong 0.707$ ) 倍程度といわれている。

MT 法は太陽活動の影響を受けた地磁気脈動とよばれる低い周波数帯の地磁気や地電流の変動を観測するため、人工ノイズが減少する夜間に少なくとも 1 晩以上の観測を行わなければならない。しかしながら、MT 法でも地磁気や地電流の変動は小さくノイズと識別が難しいので、図 6.3.1 に示したように、調査地から離れたノイズの少ない場所に固定観測点を設けて同時観測を行い、固定観測点での観測データと相関のある変動を信号とみなすことでノイズの影響を低減させる。この測定法をリモートリファレンス法、固定観測点を固定リファレンス点とよぶ。

MT 法を含めた電磁探査や電気探査で得られる電氣的物性は比抵抗である。比抵抗は、単位断面を通る電流の単位長さあたりの電気抵抗である。層状の地層や大きな亀裂をもつ岩石では測定する方向によって比抵抗が異なる、すなわち異方性を示す。MT 法以外の電磁探査や電気探査は方向性を考慮した探査を行うことができないが、MT 法では方向性を考慮した探査を行うことができる。例えば大きな断層周辺で行う場合、断層に沿う方向の比抵抗を TE モード、直交する方向の比抵抗を TM モードとよぶ。

MT 法は、一般に南北方向 (x 方向) の磁場  $H_x$  と電場  $E_x$ 、東西方向 (y 方向) の磁場  $H_y$  と電場  $E_y$  を観測する。磁場や電場の記号が太字となっているのは、複素数であることを意味している。磁場と電場の関係は、下式のようにインピーダンステンソル  $Z$  を定義して表すことができる。

$$\begin{pmatrix} \mathbf{E}_x \\ \mathbf{E}_y \end{pmatrix} = \mathbf{Z} \begin{pmatrix} \mathbf{H}_x \\ \mathbf{H}_y \end{pmatrix} = \begin{pmatrix} \mathbf{Z}_{xx} & \mathbf{Z}_{xy} \\ \mathbf{Z}_{yx} & \mathbf{Z}_{yy} \end{pmatrix} \begin{pmatrix} \mathbf{H}_x \\ \mathbf{H}_y \end{pmatrix}$$

比抵抗は互いに直交するインピーダンステンソル成分  $Z_{xy}$ 、 $Z_{yx}$  に関連する。すなわち、MT 法では互いに直交する 2 方向の比抵抗が求まる。x 方向を南北方向から回転させると、インピーダンステンソル  $Z$  の各成分の数値が変化する。これは南北方向および東西方向の観測から求めたインピーダンステンソル  $Z$  を使って、任意の方向の比抵抗を求めることができることを意味している。

(2) 測定方法

本プロジェクトで行った MT 法の測定模式図を図 6.3.2 に示す。測定には Phoenix 社製 MTU-5A システム (MT 法および AMT 法対応) を使用し、各測点で電場 2 成分、磁場 3 成分の時間変化を時系列データとして観測した。

電場の測定には、Phoenix 社製非分極性電位電極 PE4 (鉛-塩化鉛電極) を使用し、測点の状況に応じて 50~100m 離れた 2 個の電位電極を電線で結んだ電場ダイポールを用いた。電場ダイポールの方向は、磁北を基準とする南北および東西方向とした。電位電極は深さ 30cm 程度の穴底にベントナイトと水を入れて設置し、接地抵抗の低減に努めた。

磁場の測定には Phoenix 社製インダクションコイル MTC-50 および MTC-80 を使用し、南北および東西方向 (磁北基準) の水平磁場に加えて、鉛直磁場を測定した。

本調査では、調査地域から 60km 以上離れた固定リファレンス点を設置し、各測点では夜間に 14 時間以上、リファレンス点と同時測定を行い、昼間に撤収して次の測点に移動して準備を行った。なお、各探査対象地域での測定を開始する前には、磁気センサの動作と係数を確認するキャリブレーション測定を行った。

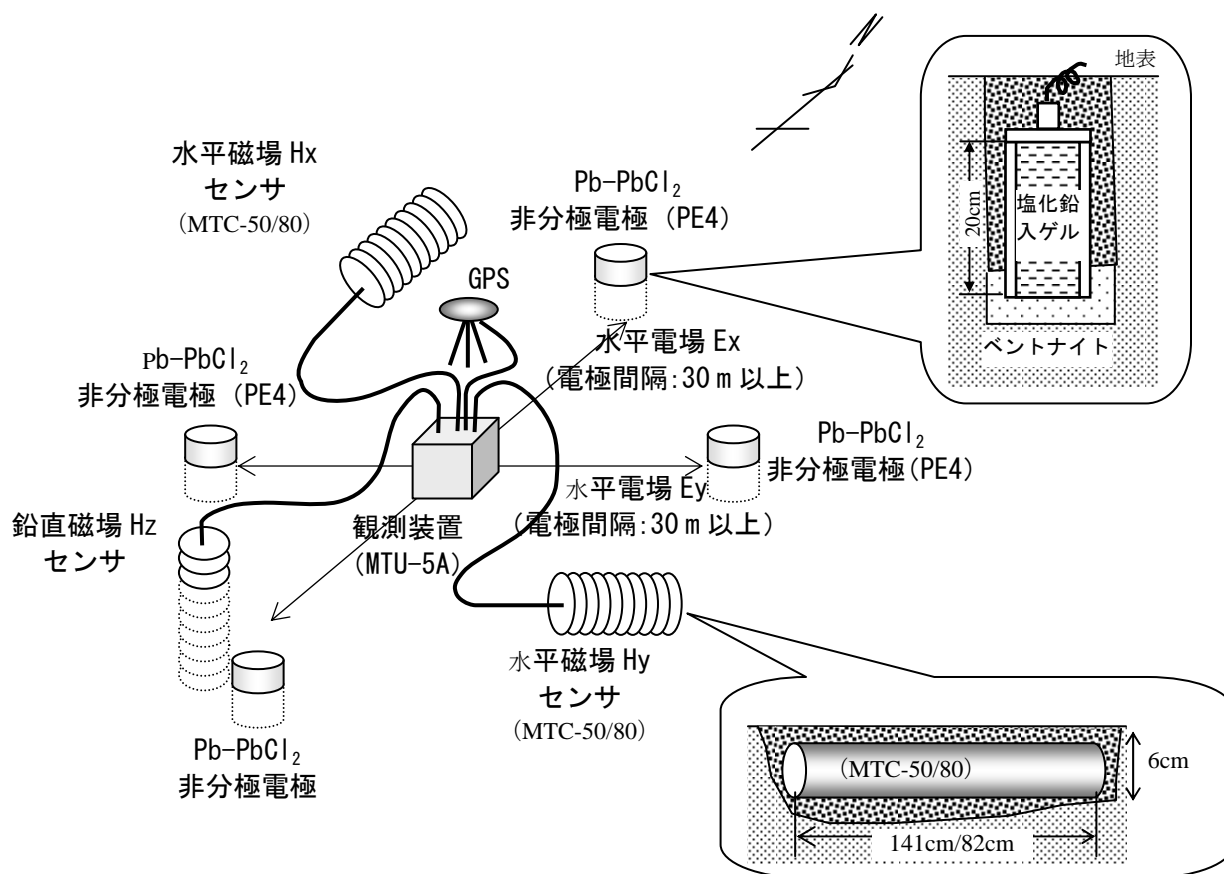


図 A.6.2 MT 法測定機器配置模式図

## (3) データ処理方法

観測装置で取得した磁場 3 成分、電場 2 成分時系列データは、測定終了後すぐに現地でノートパソコンに転送した。各成分の時系列データはフーリエ変換を用いたスペクトル解析を行って各成分の周波数  $f$  (Hz) 毎のスペクトルを求めた。スペクトル解析で求めた水平磁場成分  $\mathbf{H}_x(f)$ 、 $\mathbf{H}_y(f)$  および電場成分  $\mathbf{E}_x(f)$ 、 $\mathbf{E}_y(f)$  のスペクトル比が、周波数ごとのインピーダンステンソル  $\mathbf{Z}(f)$  の各成分となる。インピーダンステンソル  $\mathbf{Z}(f)$  から次式を使って互い直交する 2 方向の比抵抗  $\rho_{xy}(f)$ 、 $\rho_{yx}(f)$  と位相差  $\Delta\phi_{xy}(f)$ 、 $\Delta\phi_{yx}(f)$  を求めた。

$$\rho_{xy}(f) = \frac{1}{2\pi f \mu} |\mathbf{Z}_{xy}(f)| = \frac{1}{5f} \frac{|\mathbf{E}_x(f)|}{|\mathbf{H}_y(f)|}, \quad \Delta\phi_{xy}(f) = \phi\{\mathbf{H}_y(f)\} - \phi\{\mathbf{E}_x(f)\}$$

$$\rho_{yx}(f) = \frac{1}{2\pi f \mu} |\mathbf{Z}_{yx}(f)| = \frac{1}{5f} \frac{|\mathbf{E}_y(f)|}{|\mathbf{H}_x(f)|}, \quad \Delta\phi_{yx}(f) = \phi\{\mathbf{H}_x(f)\} - \phi\{\mathbf{E}_y(f)\}$$

ここで

$f$ : 周波数 (Hz)、 $\pi$ : 円周率、 $\mu$ : 透磁率

$|\mathbf{E}_x(f)|$ 、 $|\mathbf{E}_y(f)|$ : 電場強度 (V/m)、 $|\mathbf{H}_x(f)|$ 、 $|\mathbf{H}_y(f)|$ : 磁場強度 (nT)

$\phi\{\mathbf{E}_x(f)\}$ 、 $\phi\{\mathbf{E}_y(f)\}$ : 電場位相 ( $^\circ$ )、 $\phi\{\mathbf{H}_x(f)\}$ 、 $\phi\{\mathbf{H}_y(f)\}$ : 磁場位相 ( $^\circ$ )

求めた比抵抗  $\rho_{xy}(f)$ 、 $\rho_{yx}(f)$  は大地の比抵抗が一樣である場合にはその比抵抗を表すが、実際には一樣ではないので近似的な比抵抗となるため、MT 法では見掛比抵抗とよぶ。位相差も、位相とよんで  $\phi_{xy}(f)$ 、 $\phi_{yx}(f)$  と表す。図 A.6.3 に示すように周波数  $f$  の常用対数を横軸にとり、縦軸に見掛比抵抗の常用対数をとった両対数グラフを見掛比抵抗曲線とよぶ。また、周波数  $f$  の常用対数を横軸にとり、縦軸に位相をとった両対数グラフを位相曲線とよぶ。

本プロジェクトでは、測定した時系列データを 20 のセグメントに分割し、セグメント毎にデータ処理を行って見掛比抵抗や位相等を求めた。周波数毎に 20 個ずつのデータ処理値が求まるが、それらを統計処理し、ばらつきをエラーバーの形式で見掛比抵抗曲線や位相曲線上に表示した。一般に、見掛比抵抗曲線や位相曲線に表示されるエラーバーが小さく、滑らかな曲線となっているほどデータ品質がよい。測定点での観測データのみを用いてデータ処理を行うことをローカル処理とよぶが、本プロジェクトでは、ノートパソコンへのデータ転送後にローカル処理を行い、ノートパソコンのディスプレイ上に表示した見掛比抵抗曲線、位相曲線から観測データの品質チェックを行った。

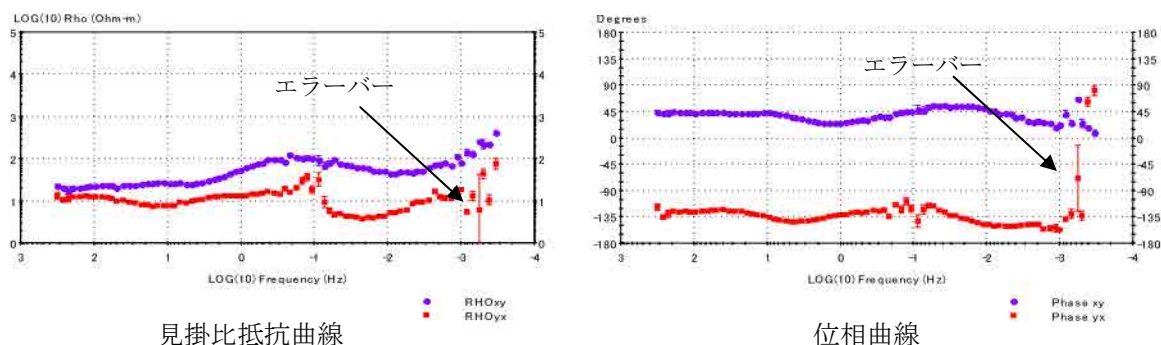


図 A.6.3 見掛比抵抗曲線・位相曲線例

本調査のデータ処理では、MT 法に関しては 320Hz～0.00034Hz の範囲の 80 周波数で、それぞれインピーダンステンソル  $Z(f)$  を求めた。

現地調査終了後、固定リファレンス点の時系列データを用いてリモートリファレンス処理を行い、局所ノイズの除去を行った。リモートリファレンス処理を模式的に示すと、図 A.6.4 に示すようになる。測点データにも固定リファレンス点にも、信号の他に丸で囲んだような送電線、商用電線、人家、車両の通行などに関連する電磁ノイズが含まれている。測点と固定リファレンス点が十分離れていれば、信号の相関は良いのに対し、ノイズの相関は低くなるはずである。したがって、クロス・コリレーションとよばれる相互相関処理を行うと測点データではノイズが除去されて信号のみのデータとなる。

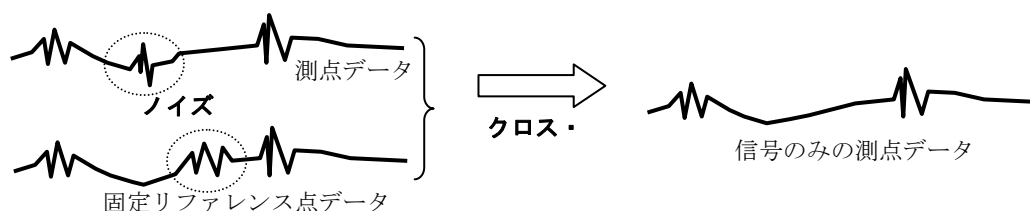


図 A.6.4 リモートリファレンス処理模式図

リモートリファレンス処理に至るまでの一連のデータ処理には Phoenix 社製 SSMT2000 を使用した。データはリファレンス処理後に測点ごとにエラーバーが小さく、滑らかな見掛比抵抗曲線や位相曲線が得られるよう、各周波数毎に S/N の高いセグメントのスペクトルを取捨選択するエディット処理を行った。エディット処理には Phoenix 社製 MT editor を使用した。

(4) 解析方法

上述のデータ処理によって得られる見掛比抵抗  $\rho_{xy}(f)$ 、 $\rho_{yx}(f)$  は周波数に対応する探査深度（表皮深度の約 0.707 倍程度）付近までの平均的な比抵抗を表しているにすぎない。見掛比抵抗

曲線や位相曲線を基に地下の比抵抗分布を推定するために2次元解析を実施した。

解析に際しては、調査地域の大局的な走向を考慮して設定した測線の測線方向が y 方向、それに直交する方向が x 方向となるように、インピーダンステンソルを回転させ、x 方向の電場と y 方向の磁場から求められる見掛比抵抗を TE モードの見掛比抵抗（構造に平行）、y 方向の電場と x 方向の磁場から求められる見掛比抵抗を TM モードの見掛比抵抗（構造に直交）とみなし、2次元解析の入力値として使用した。

2次元解析は、測線と直交する方向には比抵抗構造が変化せず、無限に連続するという仮定の下で、観測されたインピーダンスを最もよく説明する比抵抗モデルを自動解析によっても求めるものである。解析セルの比抵抗は断面上の全測点の見掛比抵抗から非線形最小二乗法を使って決定する。隣接する測点の見掛比抵抗および隣接する解析セルの比抵抗も考慮するため、比較的連続性のよい合理的な解析結果が得られる。

本プロジェクトでは Schlumberger 社製 WinGLink の2次元インバージョン解析ソフトウェアを使用して、2次元解析を行った。まず、各測線下の地下断面をモデル計算に用いる有限要素法の要素と、要素を組み合わせた比抵抗モデル用解析セルに分割する。要素や解析セルの大きさは解析対象範囲となる浅部の中央部ほど細かく、端部や深部に近づくにつれて大きくなるように分割する。次に、初期比抵抗モデルとして  $100\Omega \cdot m$  の均質モデルを適用し、この比抵抗モデルに誘導される電磁場を有限要素法で計算し、各測点の計算見掛比抵抗を求めた。この計算見掛比抵抗と該当する観測見掛比抵抗を比較し、RMS（Root Mean Square の略：平均二乗）誤差が許容値以下になるまで、比抵抗モデルの修正を繰り返す反復修正法を用いた。

#### A.6.1.2 TEM 法探査

##### (1) 探査原理

TEM 法は Transient Electromagnetic（過渡現象電磁）法の略称で、人工的に送信した磁場を切った時の磁場の時間変化を観測する探査法という意味である（図 A.6.5）。

地面上を正方形（長方形や円形でも良い）に一周させた電線（送信ループ）に電流を流すと鉛直方向に人工的な磁場が発生する。電線に流した電流を切る（カットオフする）と、人工磁場を維持しようとするように地面にループ状の電流が発生する。この電流は次第に地下に深く広がっていく。この電流はその形状から渦電流とよばれ、葉巻の煙環のようなスモークリングとよばれることもある。それに応じて人工磁場は減衰していくが、比抵抗が低いほど減衰する割合が小さい。この人工磁場の減衰状況を受信用のコイルで観測して、地下の比抵抗を求める。電流切断の瞬間から早い時間帯（アーリータイム）は浅部の比抵抗を表し、遅い時間帯（レイトタイム）は深部の比抵抗を表す。

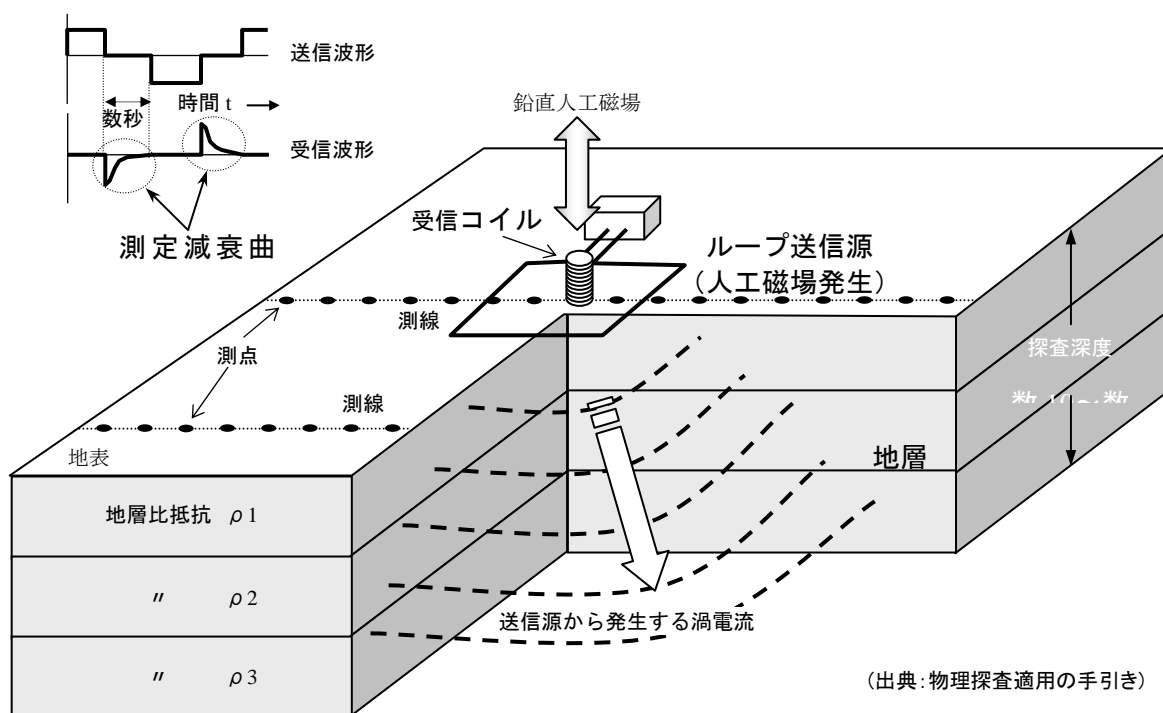


図 A.6.5 TEM 法の測定原理・測定模式図

TEM 法は、特に、探査対象が地下水、粘土層、深層風化帯、変質帯等の低比抵抗を示す（電気を通しやすい）地下構造には最も有効である。

TEM 法の調査深度  $\delta$  (m) は拡散深度とよばれる次式を目安とする。

$$\delta = \sqrt{\frac{2t\rho}{\mu}}$$

ここで、 $\rho$  : 地盤の比抵抗 ( $\Omega \cdot m$ )、 $t$  : 時間 (sec)、 $\mu$  : 透磁率

この式は、地盤の比抵抗が高いほど調査深度は深くなり、長い時間まで測定できるほど調査深度は深くなることを示唆している。

また、地下浅部に粘土層や変質帯のような低比抵抗の地層が分布する地域で電気探査を適用すると、低比抵抗の地層より深い地層の探査が困難になるが、TEM 法では深い地層まで探査できる。特に、表層付近に粘土層が分布したり、塩分濃度の高い地下水が分布したりする地域に TEM 法の適用が適している。

## (2) 測定方法

本プロジェクトでは、TEM 法探査は MT 法データのスタティック補正を目的としている。そのため調査深度としては 100m 程度が必要であるため、40mx40m の正方形ループ状に電線を地面に



這わせ、これに小型送信機で電流を流して磁場を発生させて、電線に流した電流を切った後の磁場の時間的変化を正方形ループの中心に置いた受信コイルで数分間測定するインループ配置での測定を実施した。本調査で行った TEM 法の測定模式図を図 A.6.6 に示す。測定には Geonics 社製 PROTEM CM HP 送受信システムを使用し、各測点で鉛直方向の磁場 1 成分の過渡応答現象を測定した。測定においては、送信電流は 1A 程度、時間ウィンドウ数 20、スタック回数は 10 回以上、リピートレート 237.5Hz、62.5Hz、25.0Hz の主に 3 周波数を用いた。なお、現地での測定作業期間を短縮するために Boseti 地区の一部の測定点では Phoenix 社製の V8 レシーバを用いて TEM 測定を行った。この場合の送信ループは 200mx200m を用いた。

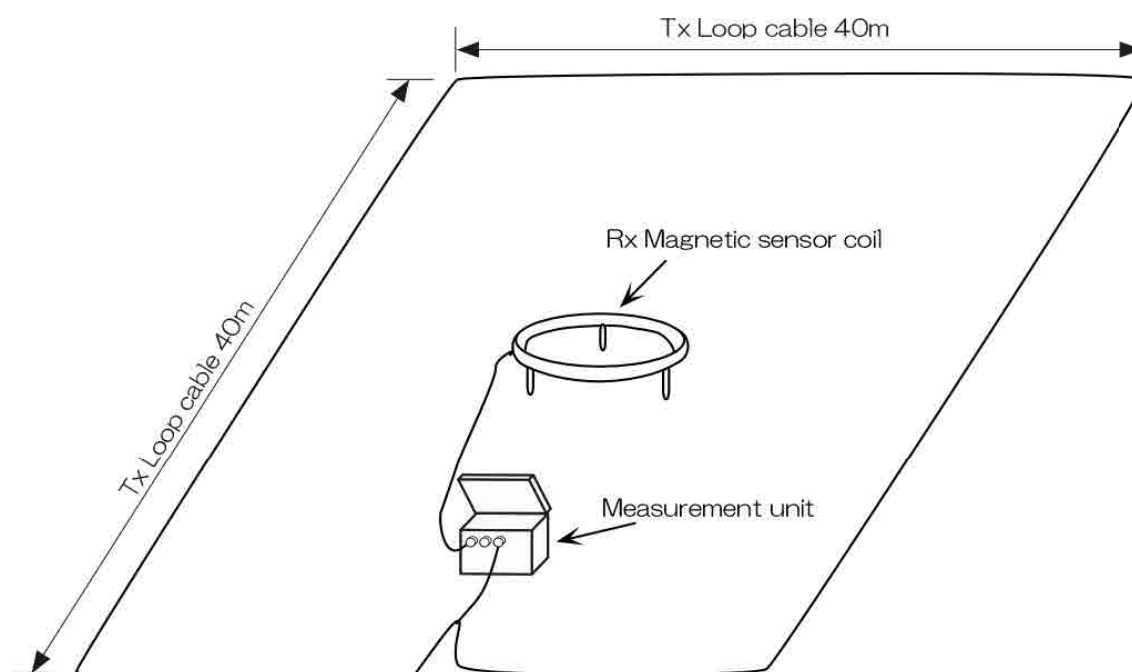
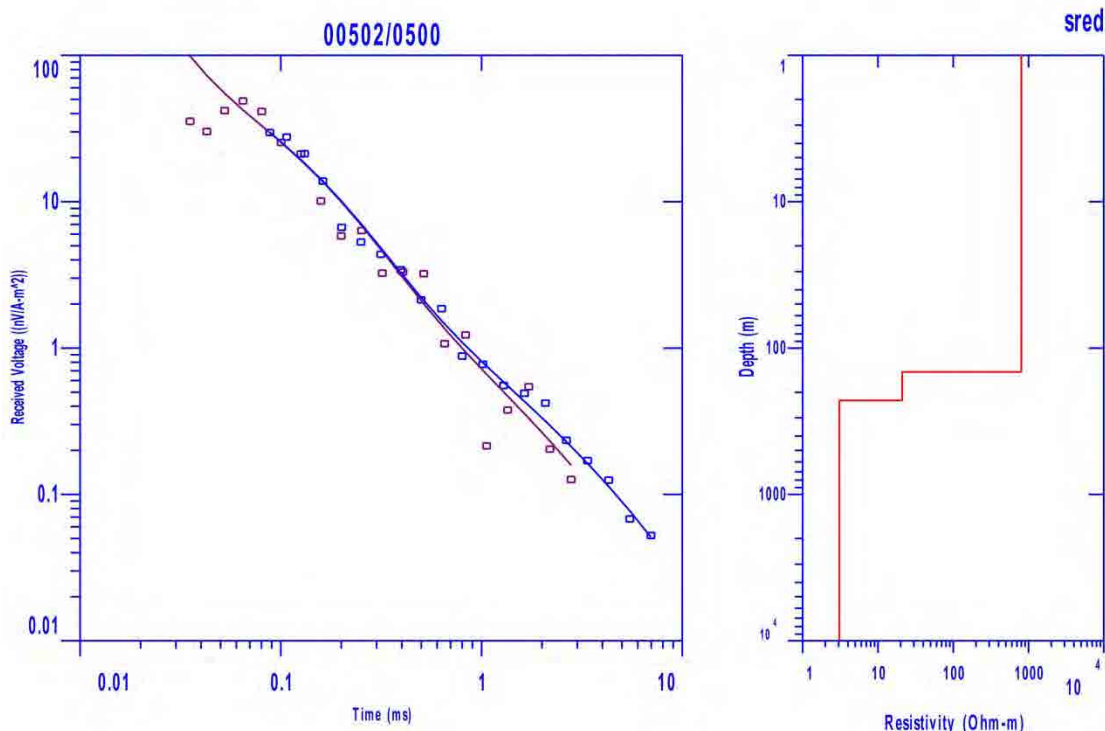


図 A.6.6 MT 法測定機器配置模式図

### (3) データ処理および解析方法

TEM 法で取得された測定データを用いて 1 次元層構造解析を行った。本調査の 1 次元解析には、Interpex 社製 IX1D を使用した。各測定点において 5~6 層の層構造を仮定し、観測された磁場の減衰曲線を最もよく説明するような水平多層構造モデルの各層の比抵抗と層厚をインバージョン解析で求めた。図 A.6.7 に測定データと 1 次元インバージョン層構造解析結果の例を示す。



測定データ:□と解析曲線:実線 (左) と 1D インバージョン解析結果 (右)

図 A.6.7 TEM法探査の測定データ例

(4) MT 法データのスタティック補正

MT 法のデータ処理で重要なもののひとつにスタティック補正がある。図 A.6.8 に示すように、測点近傍の浅所にのみ局所的な比抵抗異常がある場合、見掛け比抵抗曲線が全体的に移動した結果が得られる。解析を行う前に、局所的な異常が無い時の見掛け比抵抗曲線に戻す処理が必要である。電気探査や TEM 法などの他の電磁探査法による地下浅部の比抵抗情報を利用したり、高周波数における 2 組の見掛け比抵抗の違いを利用したりして、定性的な処理を行うことが多い。

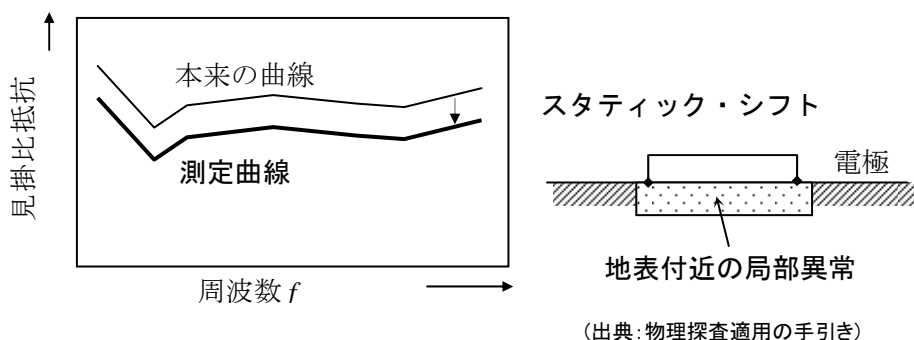


図 A.6.8 スタティック・シフト概念模式図

本プロジェクトでは MT 法探査測定点と同一の点で TEM 法探査を実施し、データの解析から求められた 1 次元比抵抗構造を基に MT 法データのスタティック補正を行った。得られた比抵抗構造を用いて MT 法の見掛け比抵抗・位相のレスポンスを算出する。MT 法の最も高い周波数の測定データを TEM 法探査の結果から算出された見掛け比抵抗曲線に合うようにシフトさせた。各測定点のスタティックシフト量を示す一覧表を巻末に添付する。

## A.6.2 物理探査結果

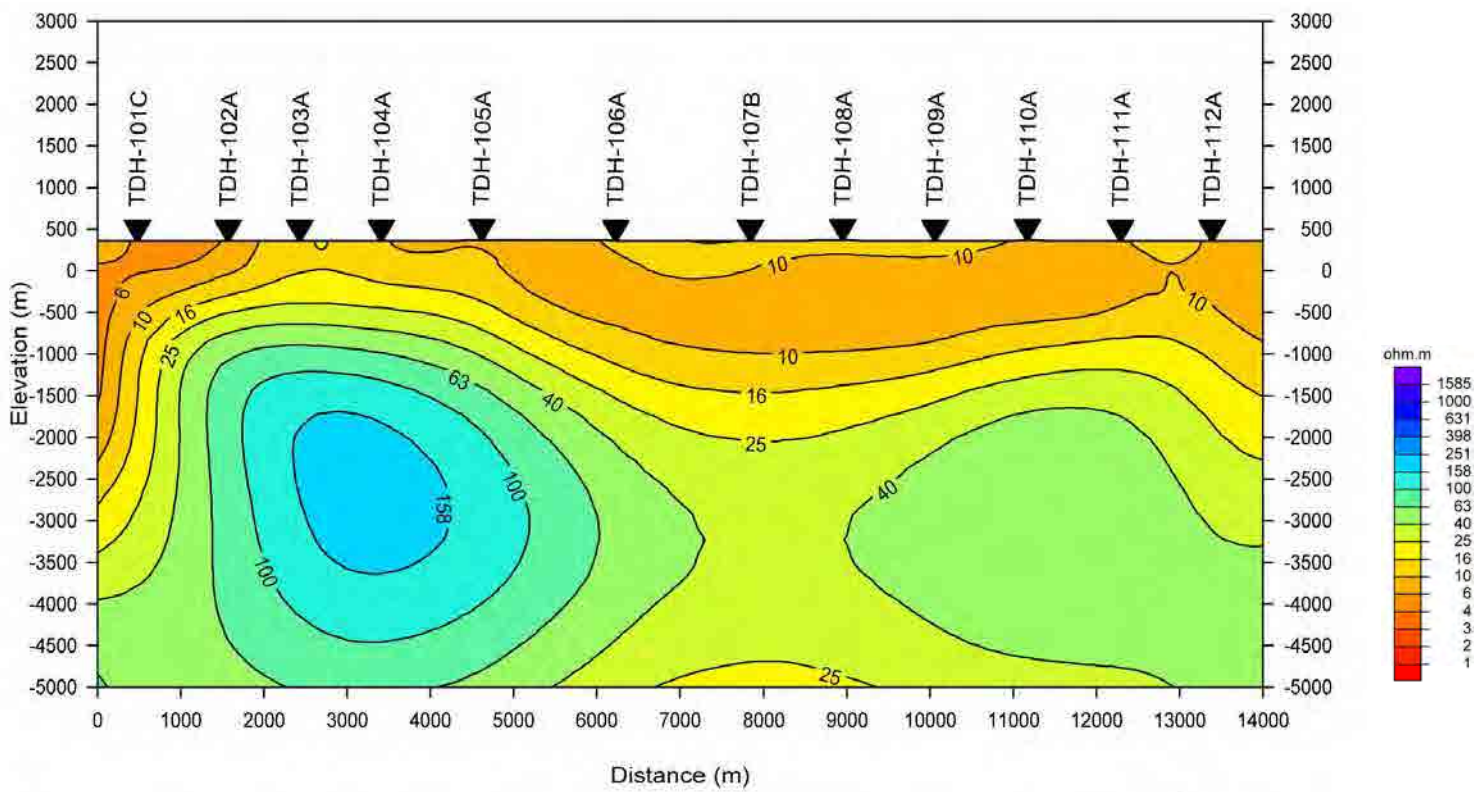
本プロジェクトで実施した物理探査結果を以下に収録する。

測点位置座標一覽表 (Tendaho-2[Ayrobera]地区)

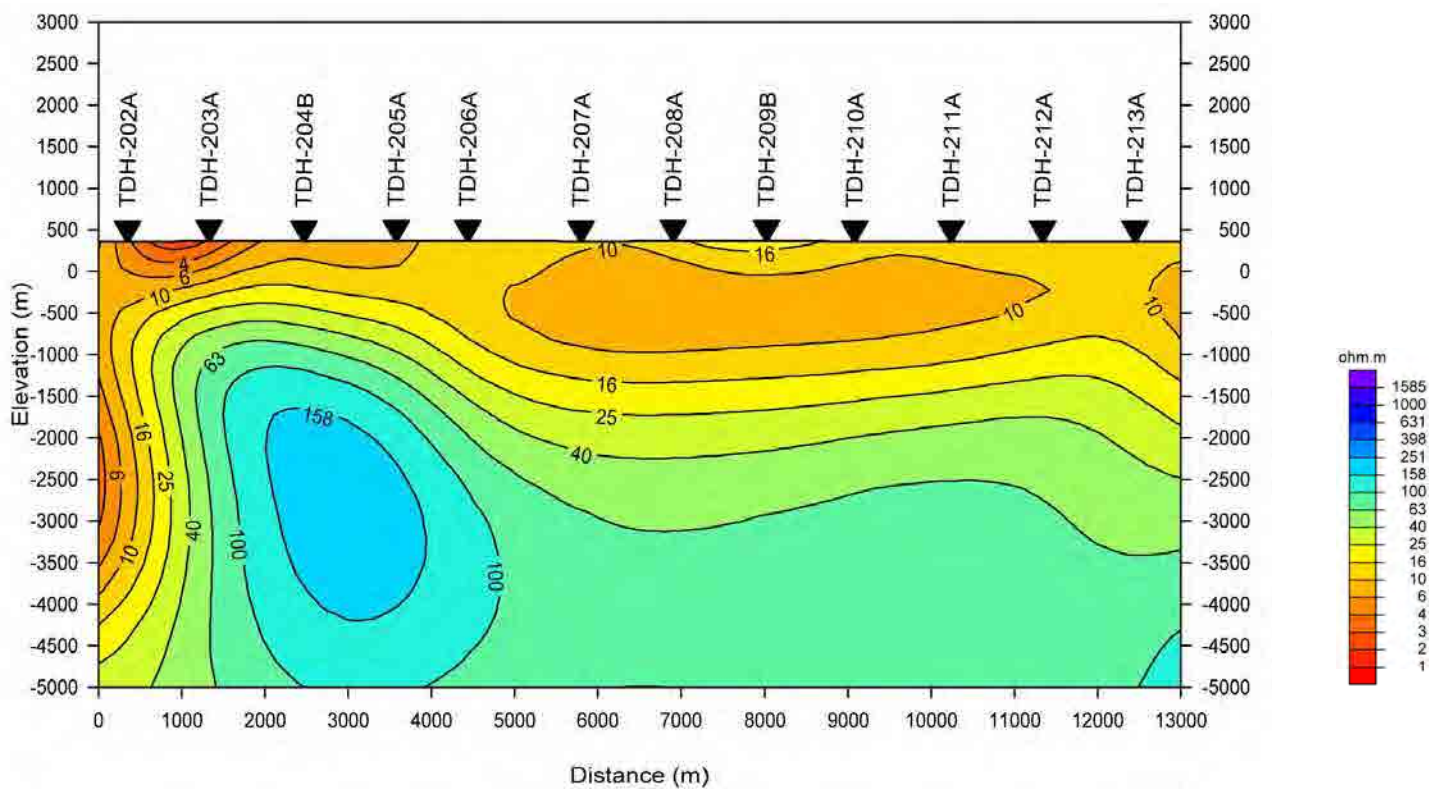
Station	Coordination (WGS84)		Elevation (m)
	Latitude	Longitude	
TDH-101	11°55'0.4"	41°1'48.6"	356
TDH-102	11°55'20.2"	41°2'18.9"	360
TDH-103	11°55'33.1"	41°2'44.2"	358
TDH-104	11°55'49.4"	41°3'11.9"	361
TDH-105	11°56'8.6"	41°3'47.0"	366
TDH-106	11°56'41.3"	41°4'28.7"	365
TDH-107	11°57'4.4"	41°5'17.0"	363
TDH-108	11°57'23.3"	41°5'48.2"	366
TDH-109	11°57'42.1"	41°6'19.5"	356
TDH-110	11°58'0.8"	41°6'50.8"	366
TDH-111	11°58'20.0"	41°7'22.2"	357
TDH-112	11°58'38.1"	41°7'53.3"	365
TDH-202	11°55'50.5"	41°1'49.4"	359
TDH-203	11°56'13.7"	41°2'13.0"	369
TDH-204	11°56'33.1"	41°2'45.4"	365
TDH-205	11°56'51.8"	41°3'16.8"	368
TDH-206	11°57'9.1"	41°3'39.2"	368
TDH-207	11°57'29.8"	41°4'19.0"	364
TDH-208	11°57'48.2"	41°4'50.5"	366
TDH-209	11°58'6.9"	41°5'21.9"	373
TDH-210	11°58'23.4"	41°5'52.8"	362
TDH-211	11°58'44.5"	41°6'24.4"	361
TDH-212	11°59'3.2"	41°6'55.6"	357
TDH-213	11°59'22.1"	41°7'26.9"	360
TDH-900 (MT-Ref: Mille)	11°16'37.0"	40°42'16.0"	512

測点位置座標一覧表 (Boseti 地区)

Station	Coordination (WGS84)		Elevation (m)
	Latitude	Longitude	
BST-201	8°38'43.8"	39°29'19.0"	1411
BST-202	8°38'38.4"	39°29'51.1"	1405
BST-203	8°38'28.7"	39°30'18.1"	1463
BST-204	8°38'17.8"	39°31'1.9"	1428
BST-205	8°38'16.2"	39°31'40.8"	1456
BST-206	8°38'10.2"	39°32'8.9"	1391
BST-207	8°37'58.3"	39°32'37.3"	1339
BST-208	8°37'47.5"	39°33'7.8"	1327
BST-300	8°39'14.8"	39°29'25.4"	1383
BST-301	8°39'7.6"	39°29'59.6"	1395
BST-302	8°39'1.5"	39°30'31.1"	1386
BST-303	8°38'55.0"	39°31'4.2"	1355
BST-304	8°38'35.3"	39°31'37.6"	1392
BST-305	8°38'34.7"	39°32'16.2"	1350
BST-306	8°38'33.4"	39°32'46.8"	1319
BST-307	8°38'27.1"	39°33'25.8"	1305
BST-400	8°39'47.8"	39°29'37.3"	1365
BST-401	8°39'45.4"	39°30'13.4"	1376
BST-402	8°39'33.2"	39°30'40.4"	1353
BST-403	8°39'25.7"	39°31'16.7"	1320
BST-404	8°39'20.4"	39°31'45.8"	1316
BST-405	8°38'59.7"	39°31'41.5"	1384
BST-406	8°39'4.8"	39°33'1.5"	1304
BST-407	8°39'3.6"	39°33'57.2"	1302
BST-501	8°40'17.6"	39°29'56.0"	1341
BST-502	8°40'6.3"	39°30'49.3"	1322
BST-503	8°39'57.5"	39°31'24.3"	1301
BST-504	8°39'48.8"	39°31'51.4"	1301
BST-505	8°39'43.9"	39°32'29.5"	1303
BST-506	8°39'34.4"	39°33'6.8"	1303
BST-900 (MT-Ref: Koka)	8°28'30.7"	39°2'27.5"	1647

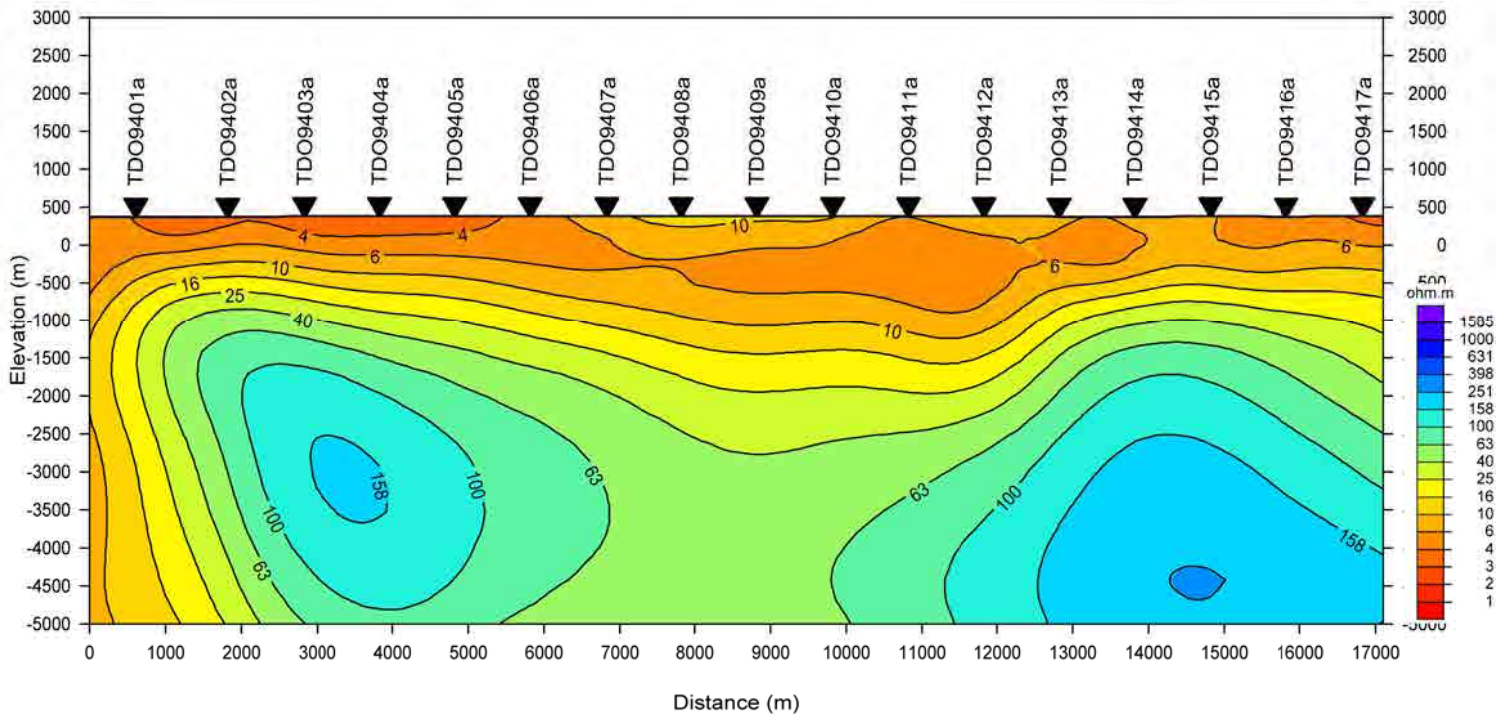


比抵抗分布断面图 (TDH100)

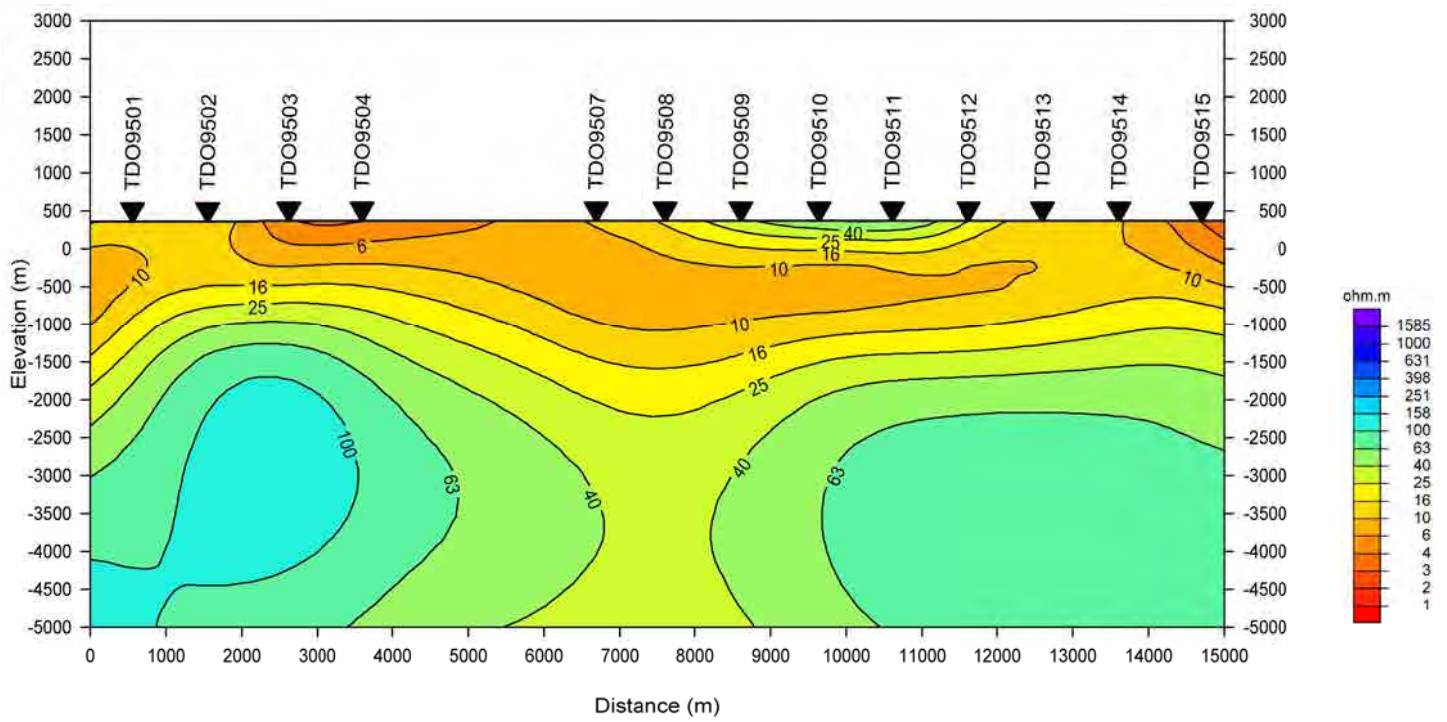


比抵抗分布断面图 (TDH200)

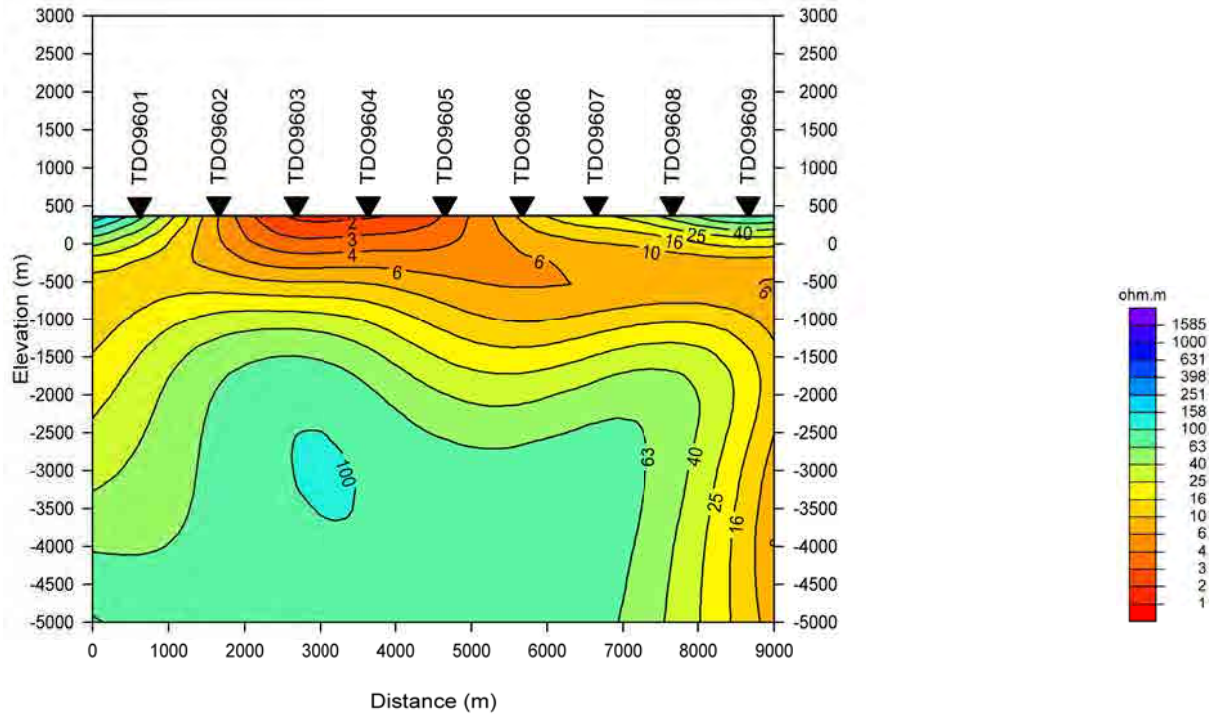




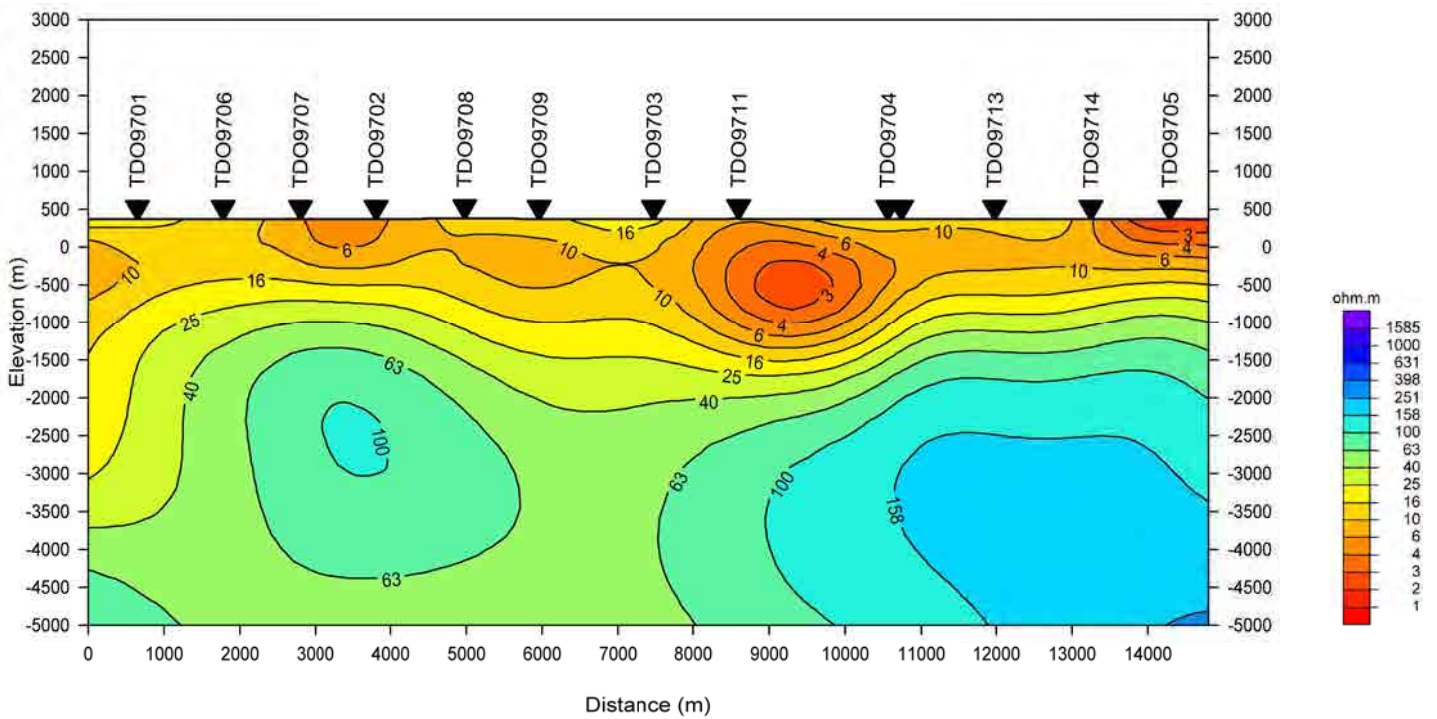
比抵抗分布断面图 (TD094)



比抵抗分布断面图 (TD095)

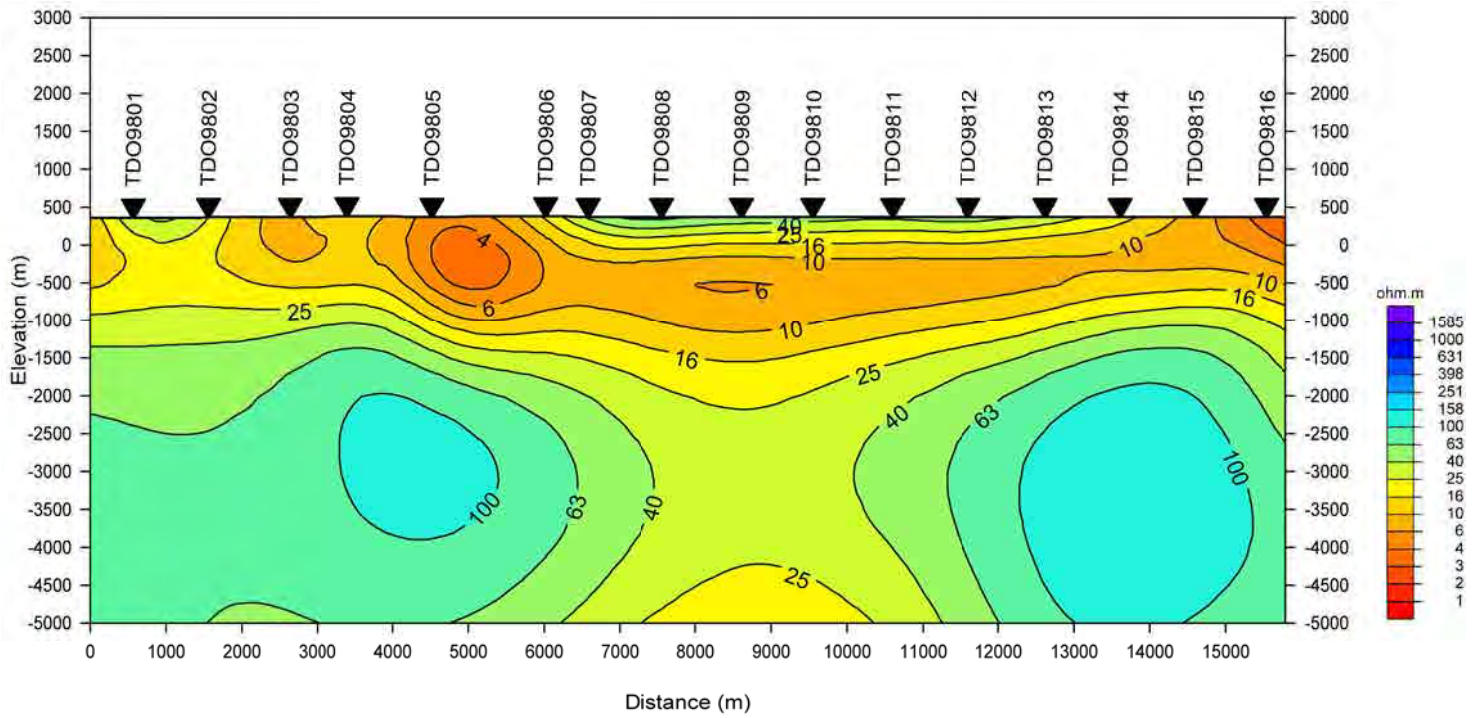


比抵抗分布断面图 (TD096)

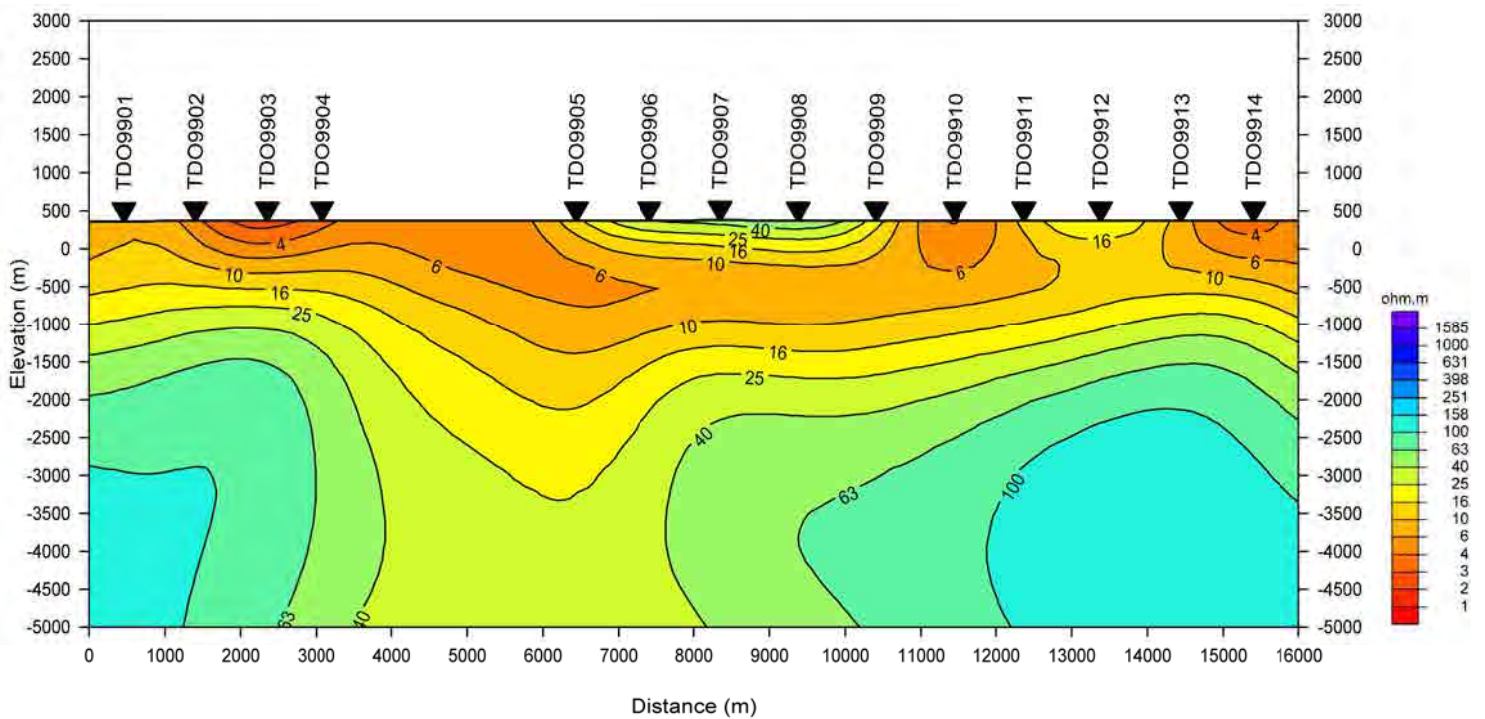


比抵抗分布断面图 (TD097)

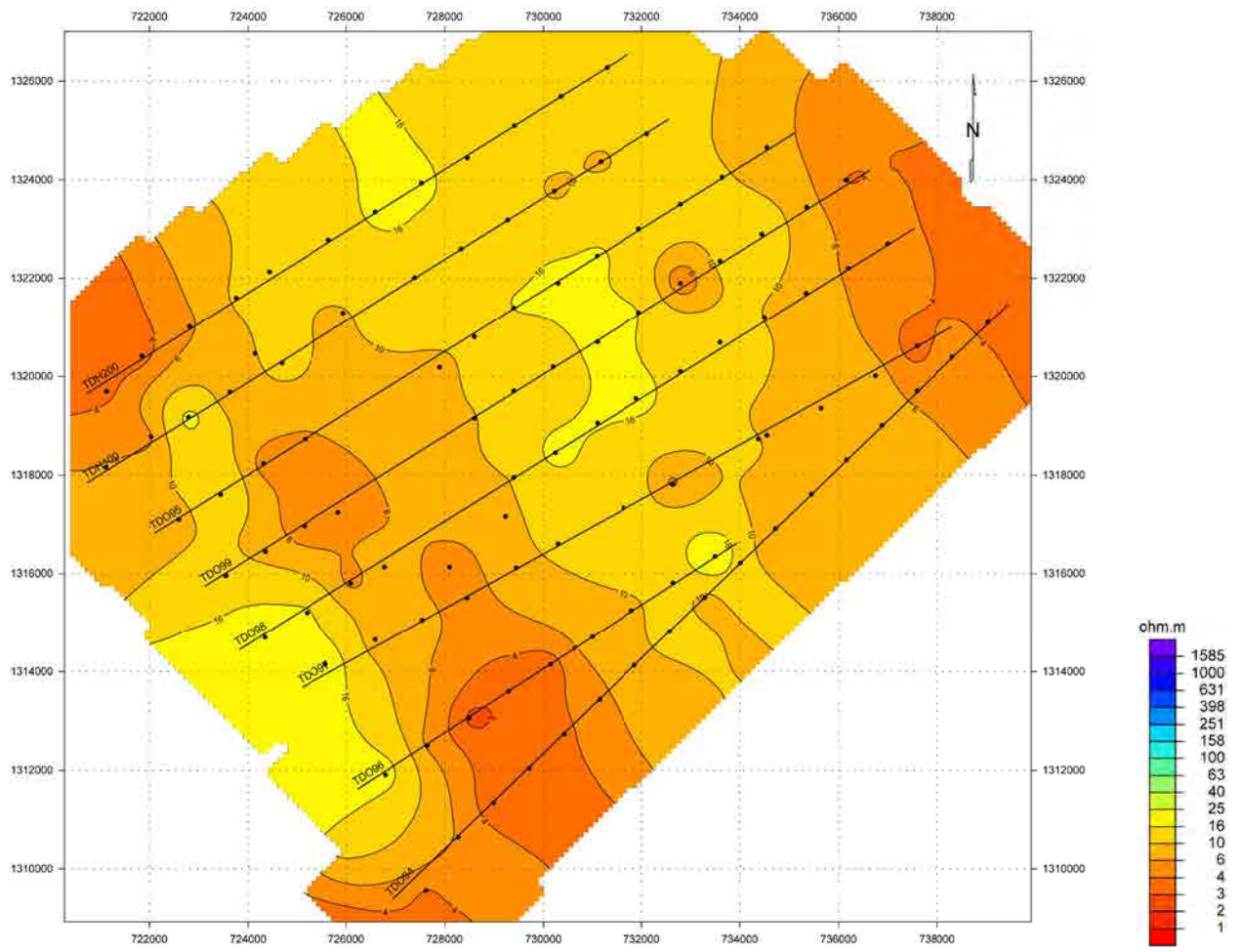




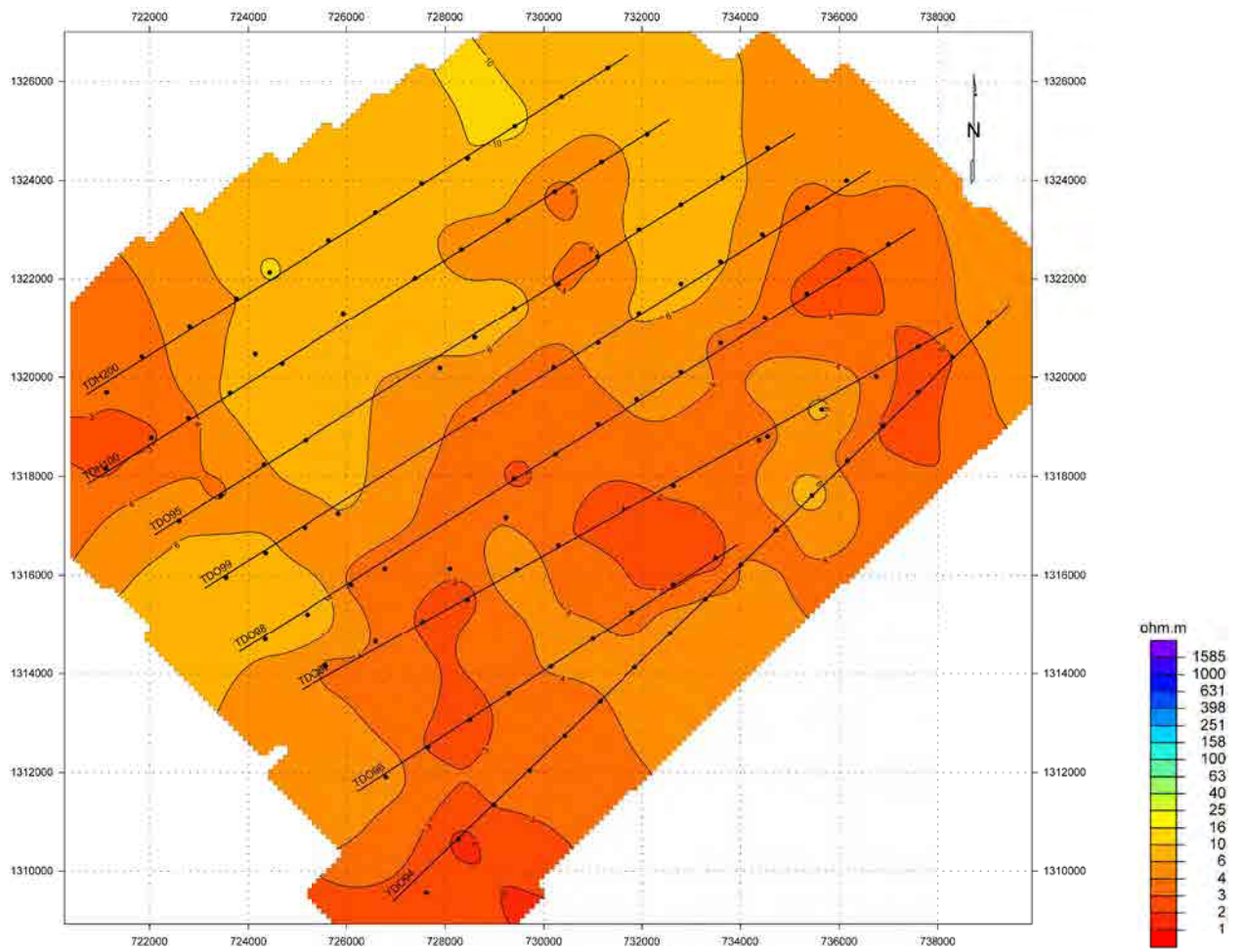
比抵抗分布断面图 (TD098)



比抵抗分布断面图 (TD099)

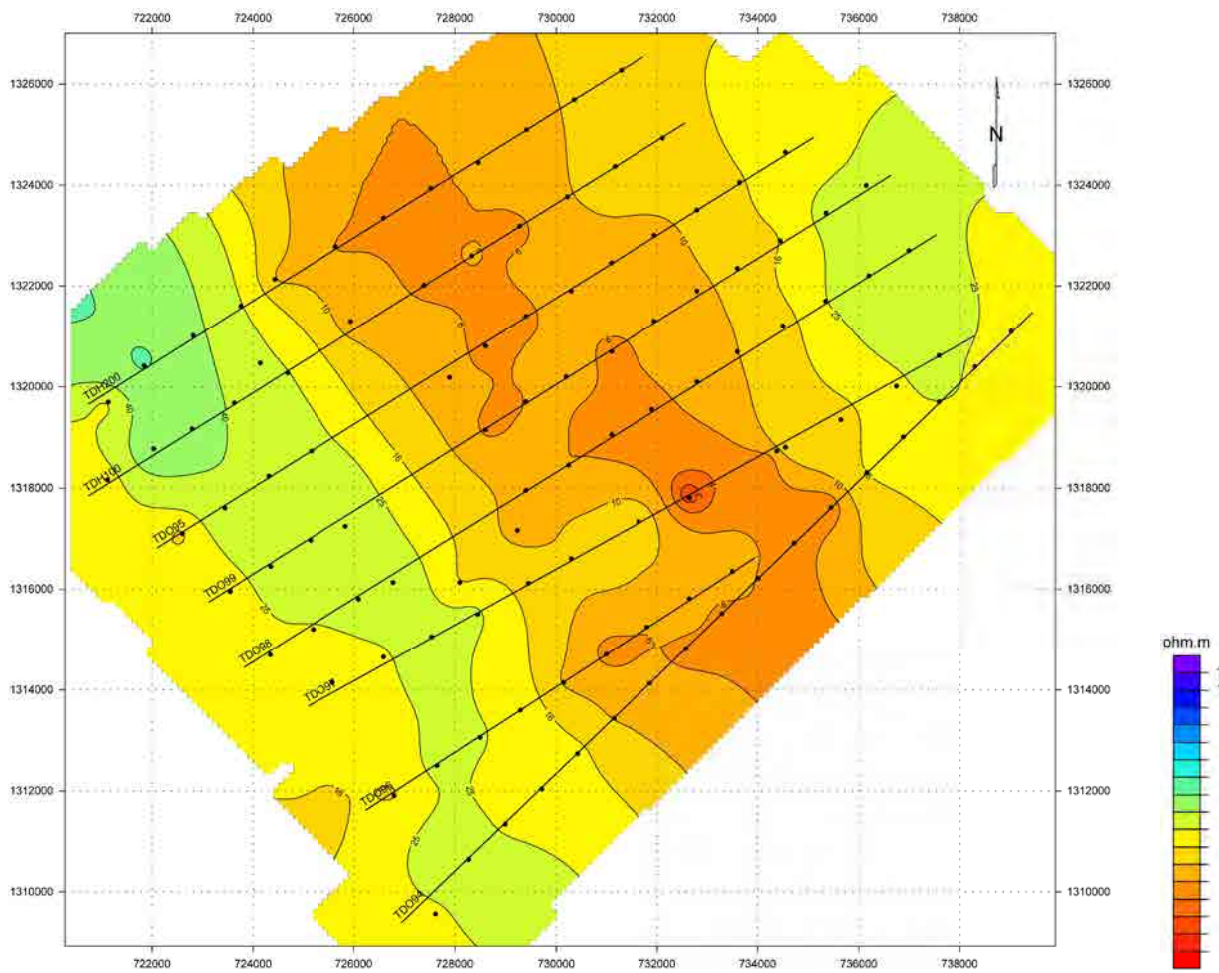


比抵抗分布平面図 (2Dモデル) 標高200m

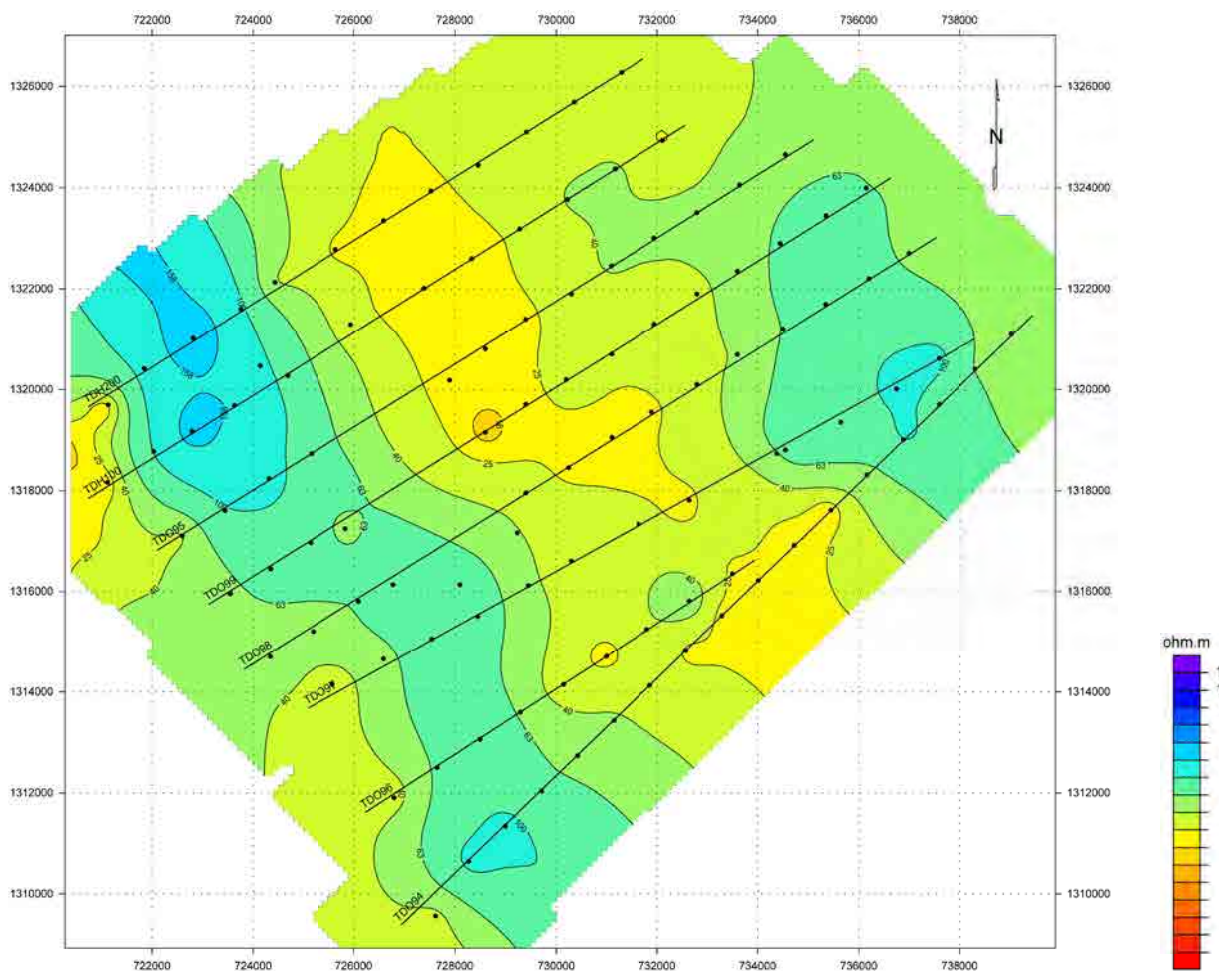


比抵抗分布平面図 (2Dモデル) 標高0m

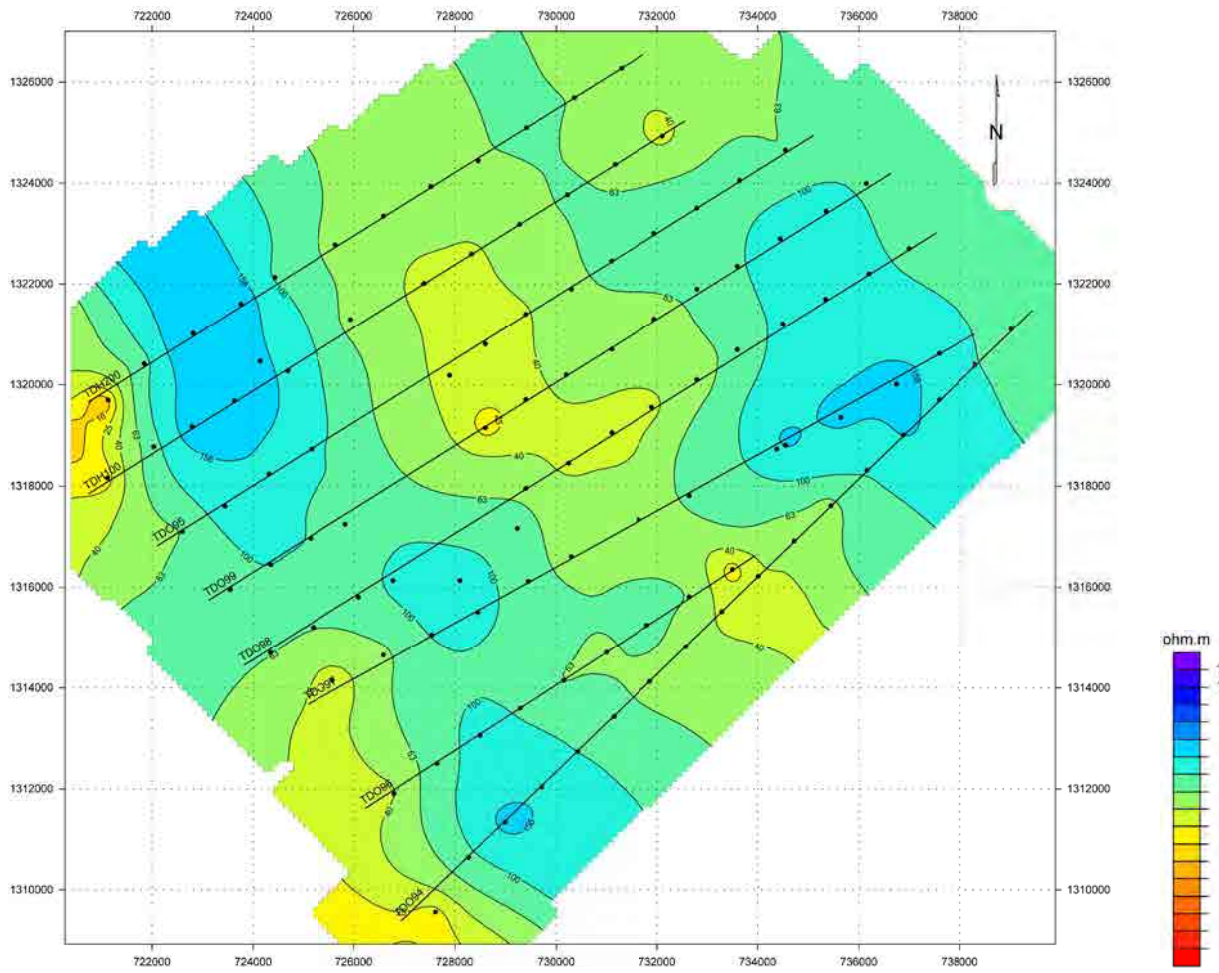




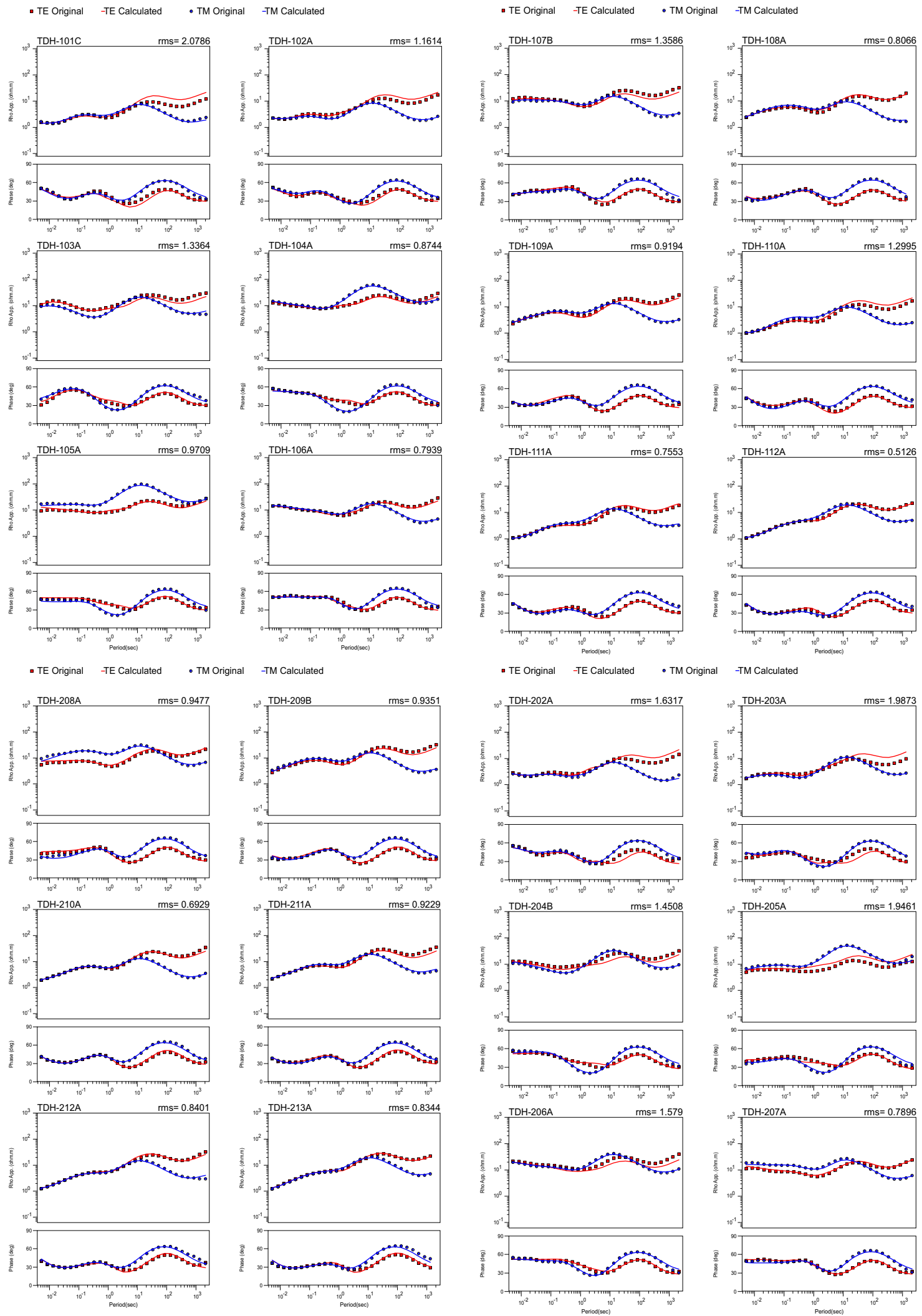
比抵抗分布平面図 (2Dモデル) 標高-700m



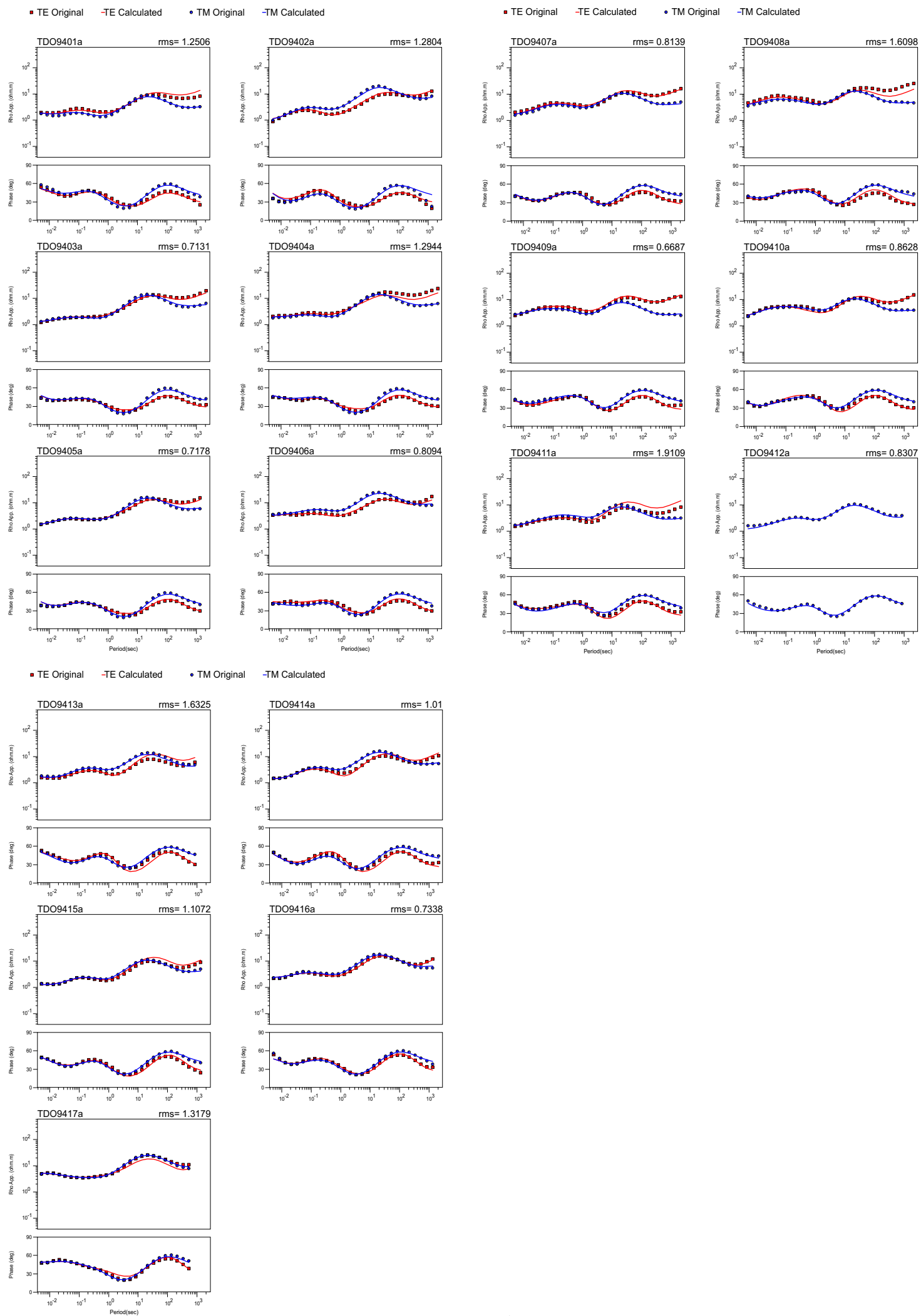
比抵抗分布平面図 (2Dモデル) 標高-1500m



比抵抗分布平面図 (2Dモデル) 標高-2500m



見掛比抵抗・位相曲線 (TDH100, TDH200)

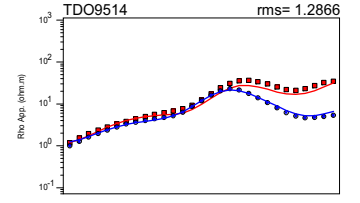
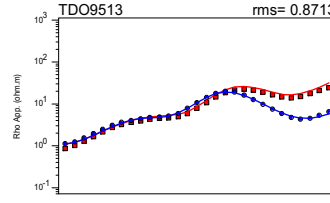
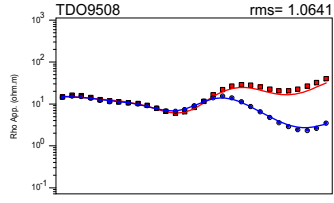
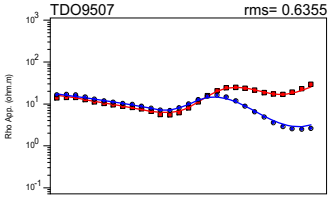
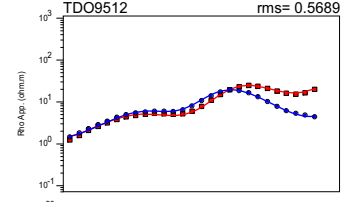
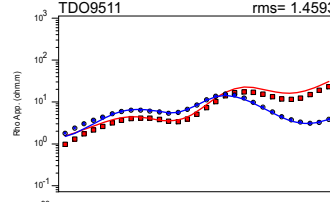
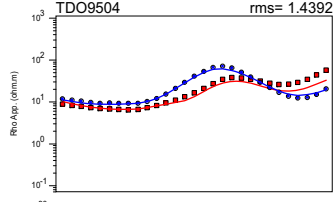
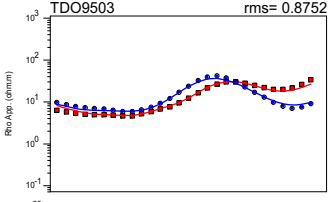
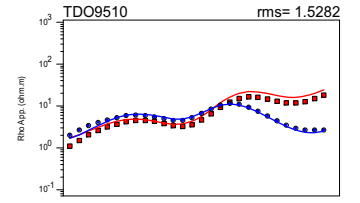
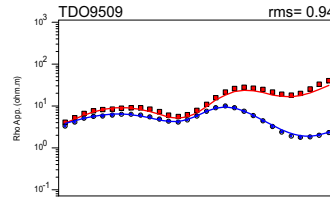
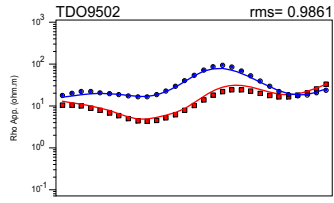
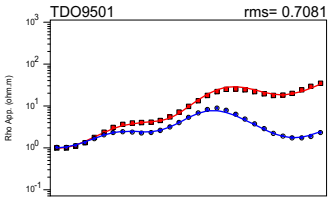


見掛比抵抗・位相曲線 (TD094)

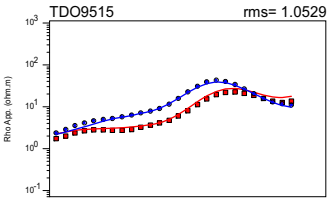


■ TE Original    -TE Calculated    ● TM Original    -TM Calculated

■ TE Original    -TE Calculated    ● TM Original    -TM Calculated



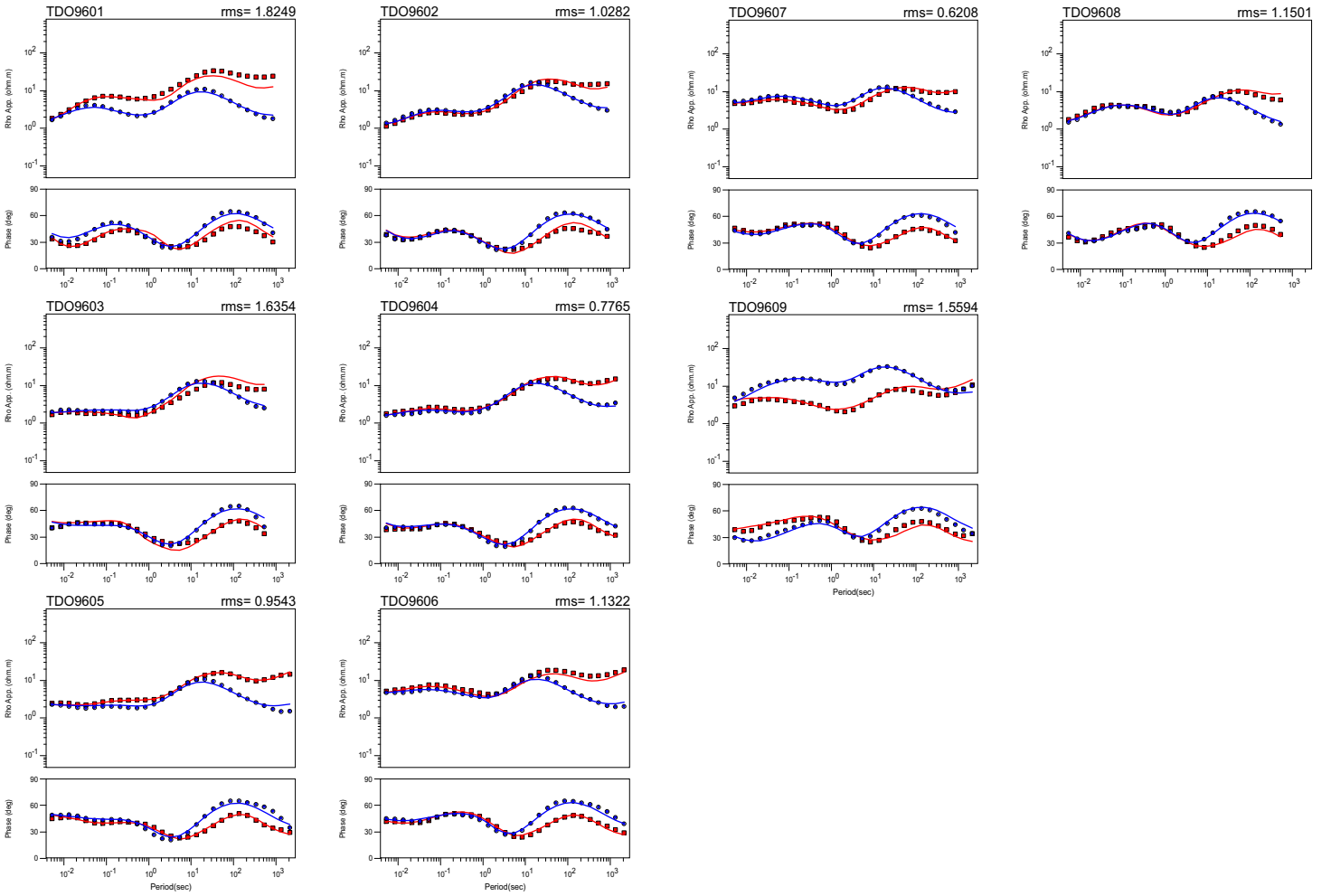
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見掛比抵抗・位相曲線 (TDO95)

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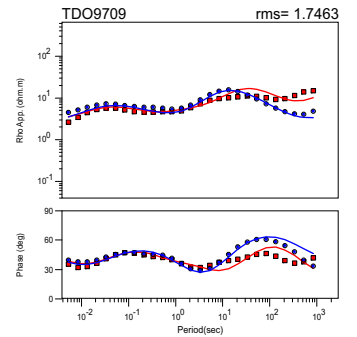
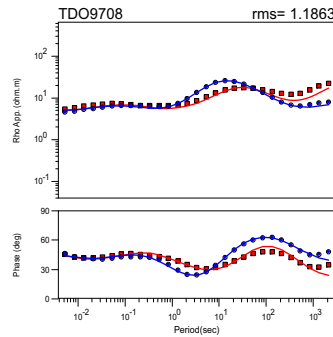
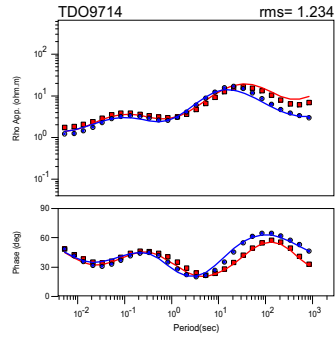
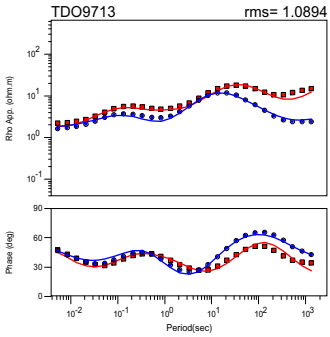
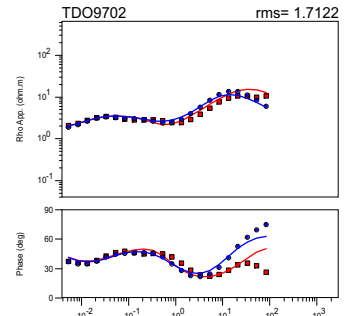
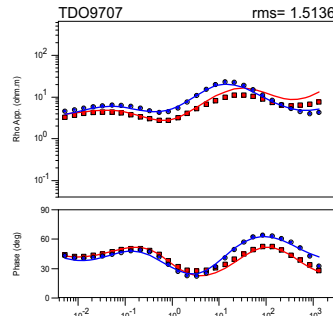
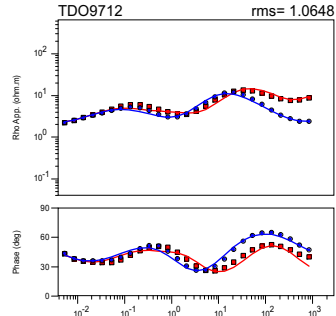
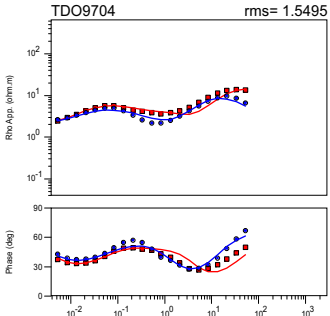
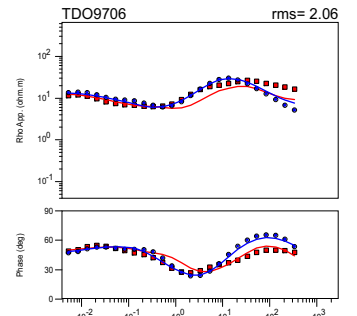
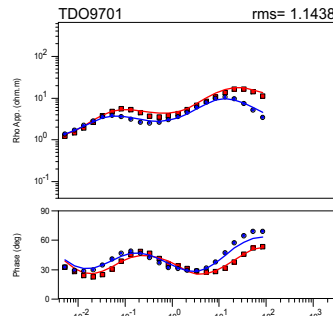
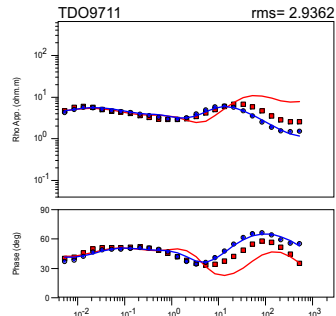
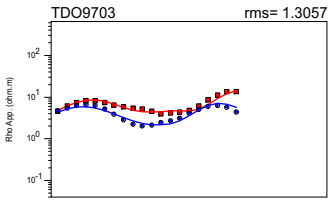
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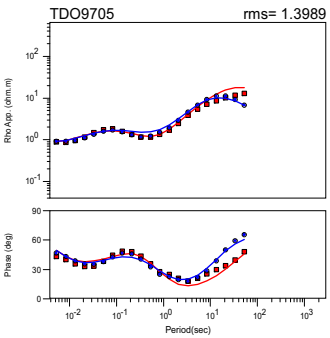
見掛比抵抗・位相曲線 (TDO96)



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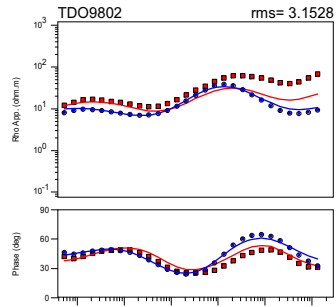
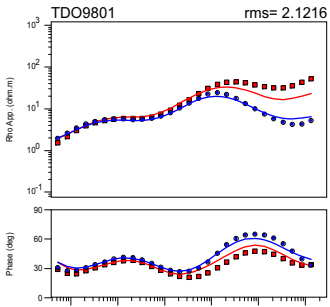


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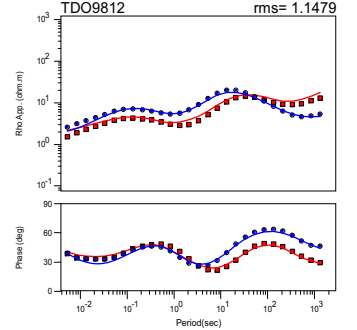
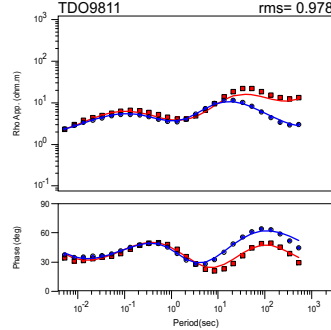
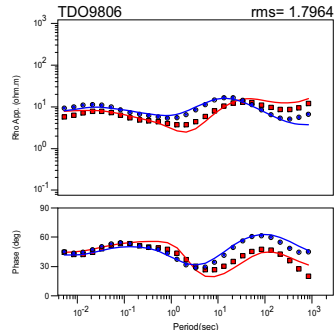
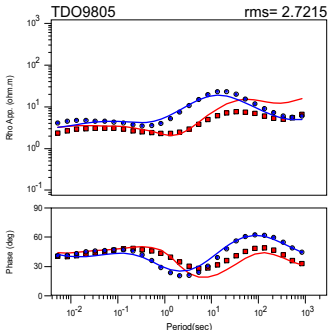
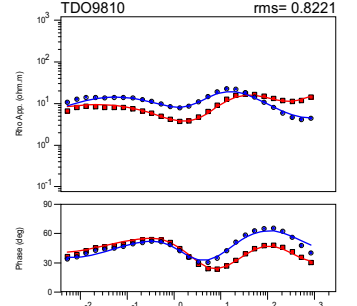
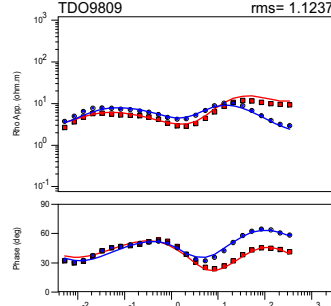
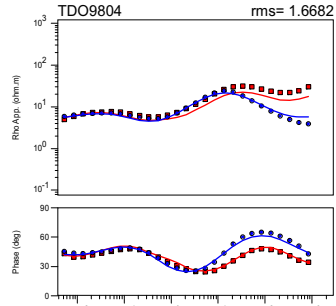
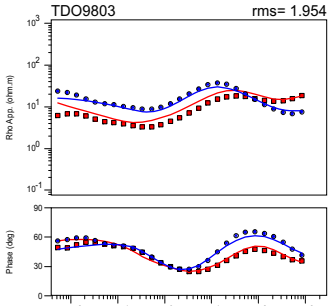
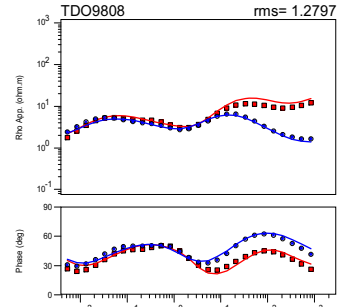
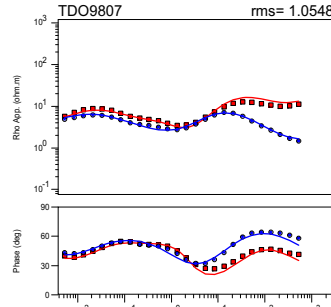


見掛比抵抗・位相曲線 (TD097)

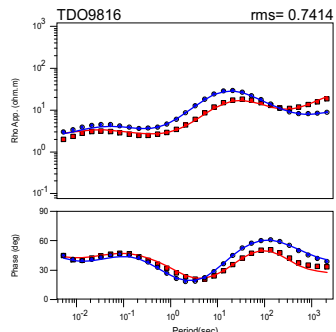
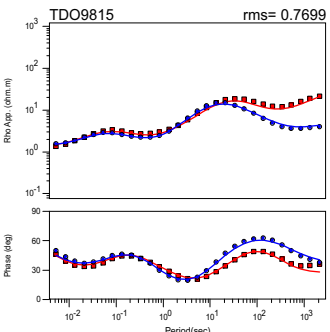
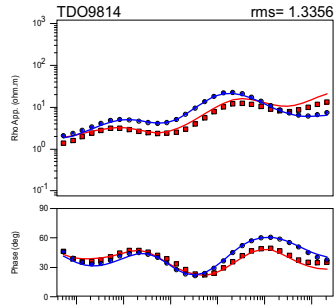
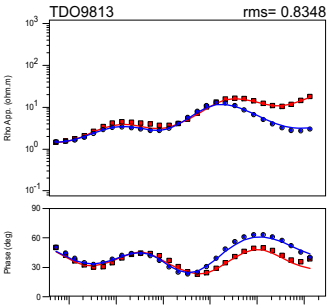
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■ TE Original    -TE Calculated    ● TM Original    -TM Calculated



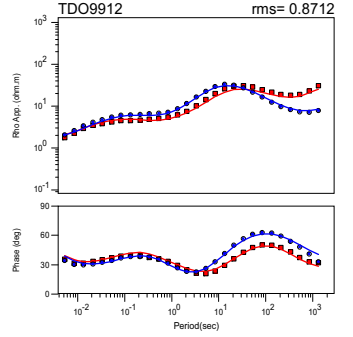
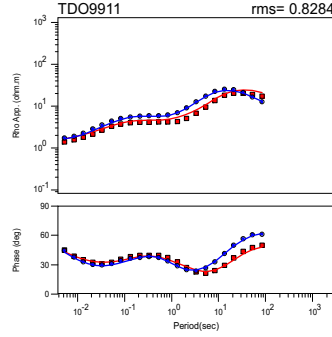
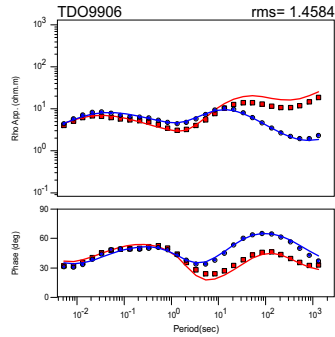
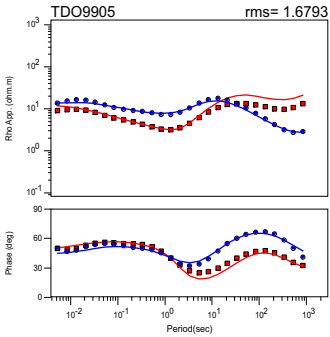
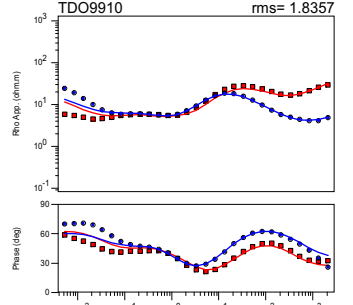
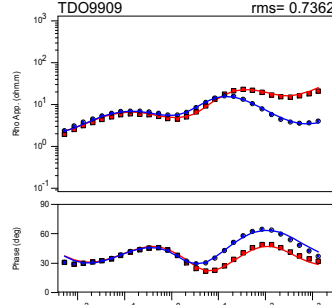
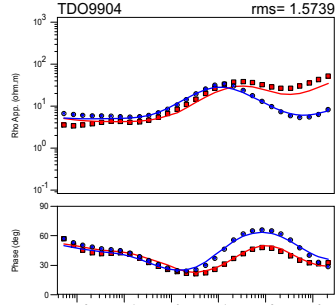
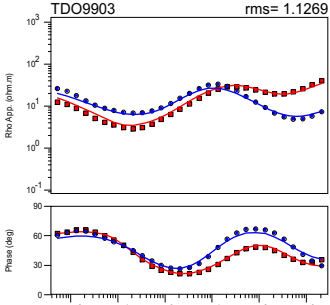
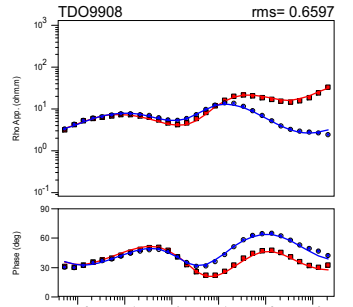
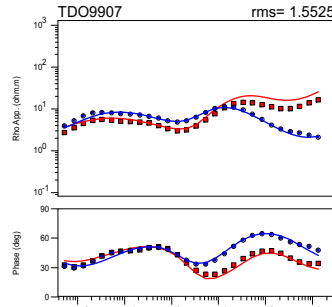
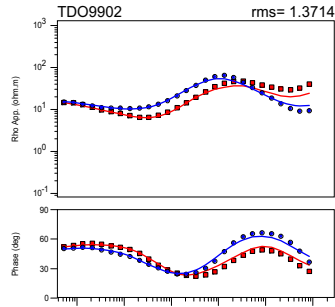
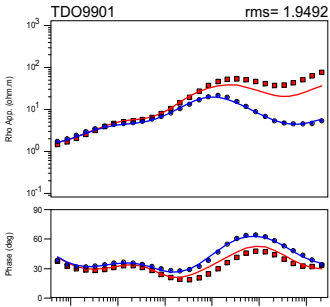
■ TE Original    -TE Calculated    ● TM Original    -TM Calculated



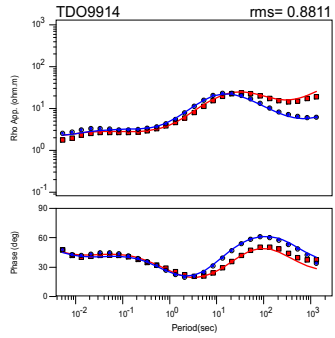
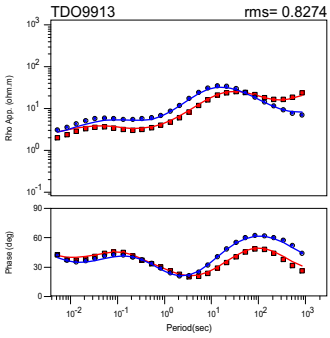
見掛比抵抗・位相曲線 (TD098)

■ TE Original    -TE Calculated    ● TM Original    -TM Calculated

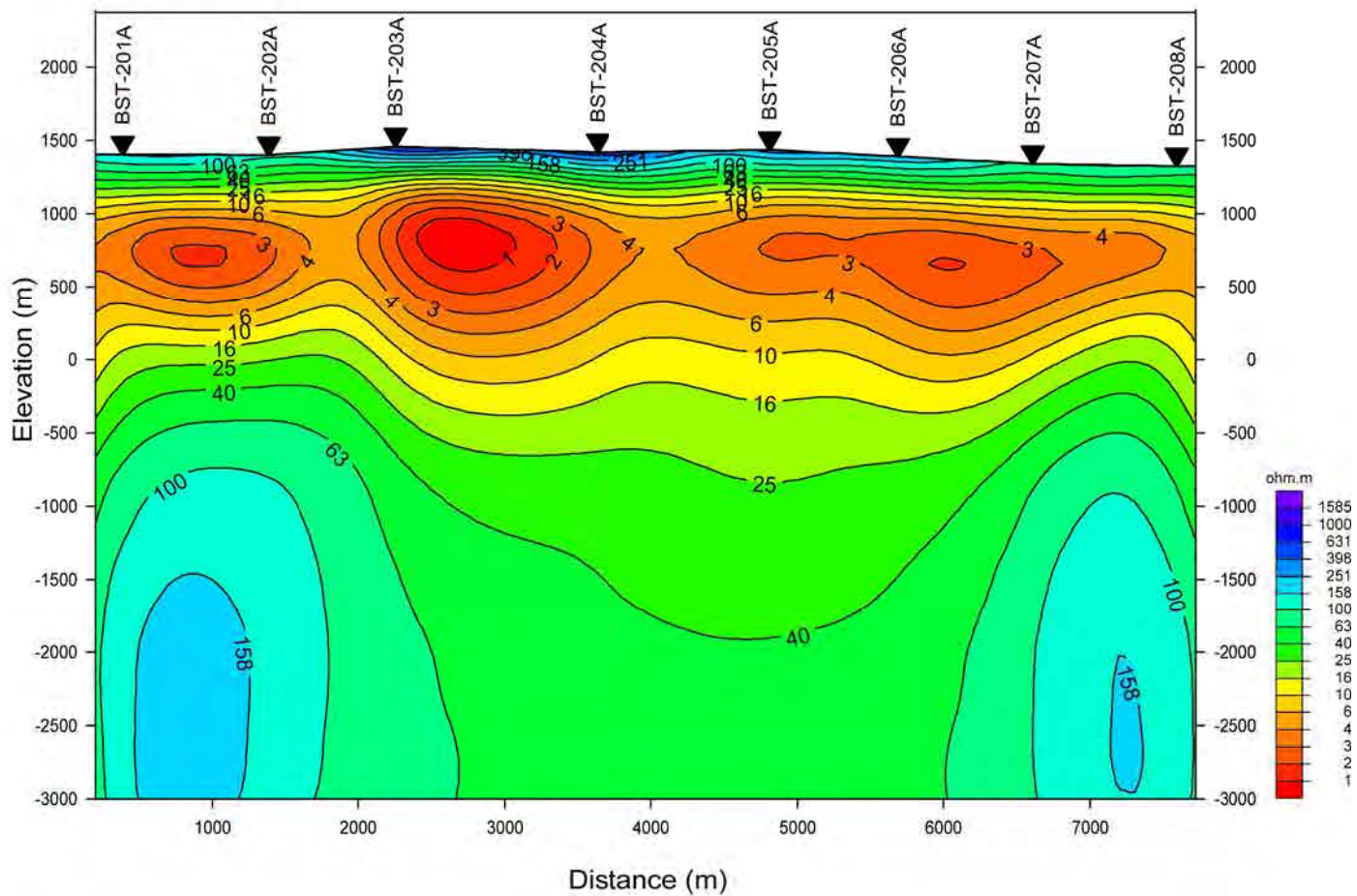
■ TE Original    -TE Calculated    ● TM Original    -TM Calculated



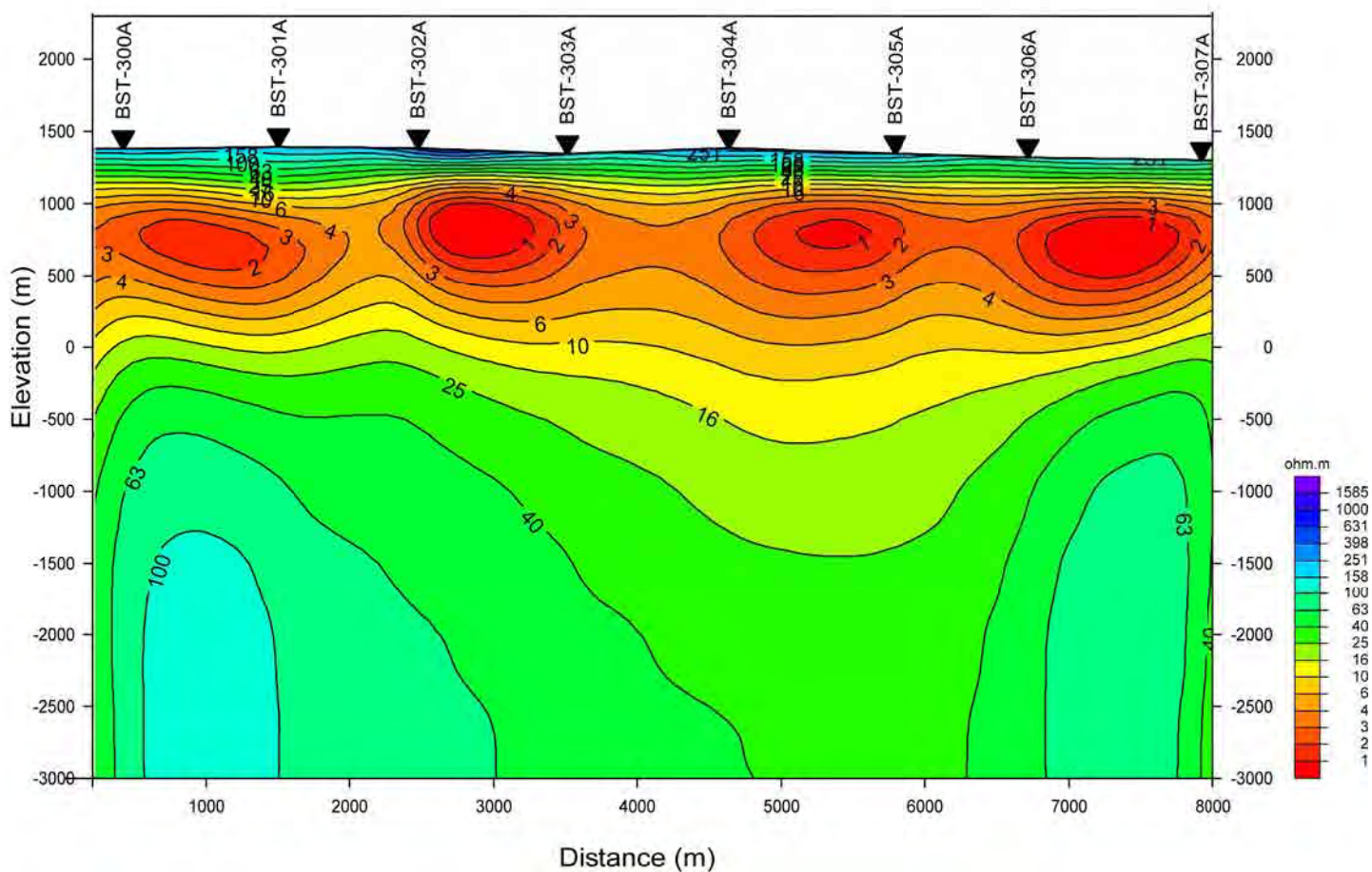
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見掛比抵抗・位相曲線 (TD09)

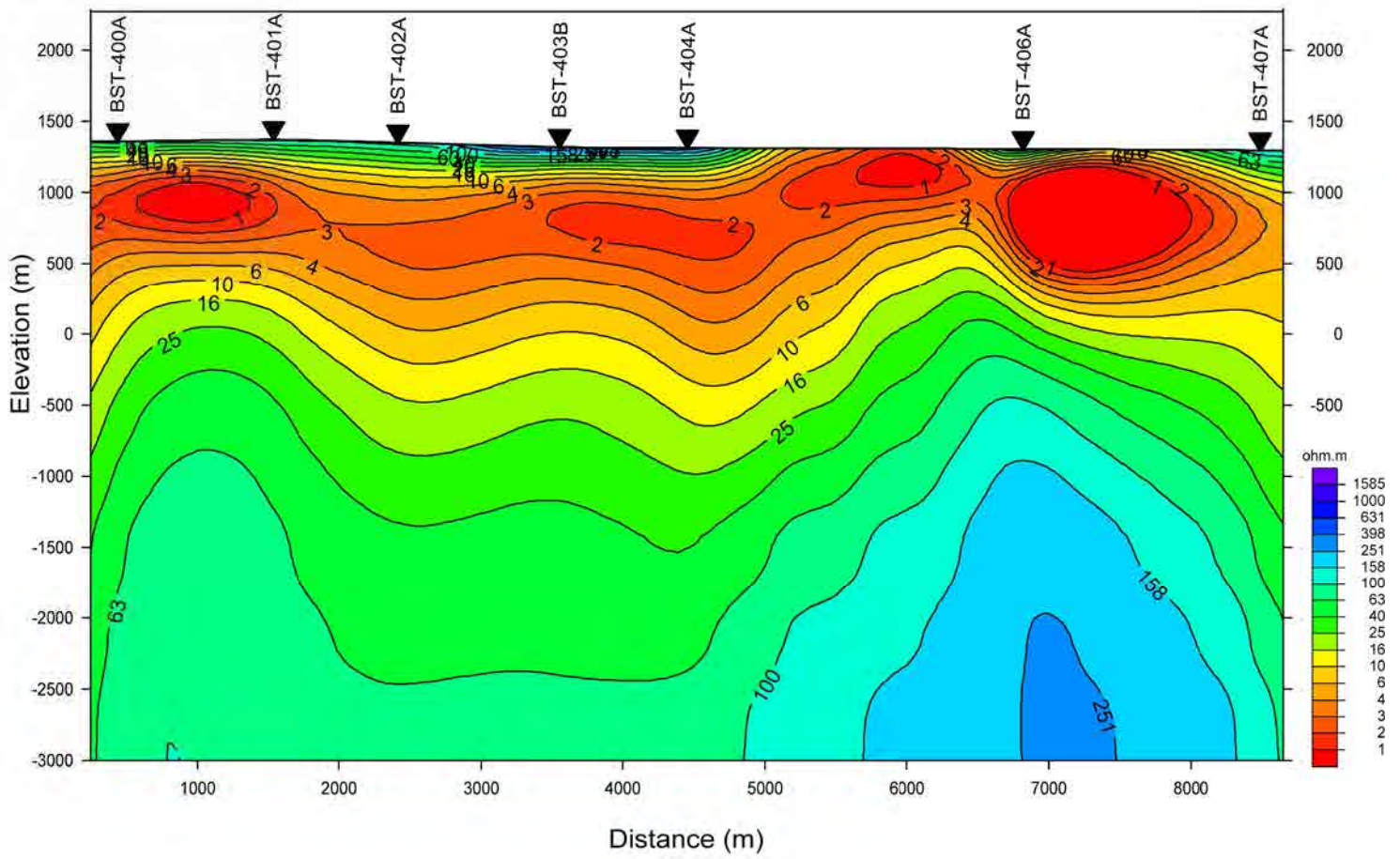


比抵抗分布断面图 (BST200)

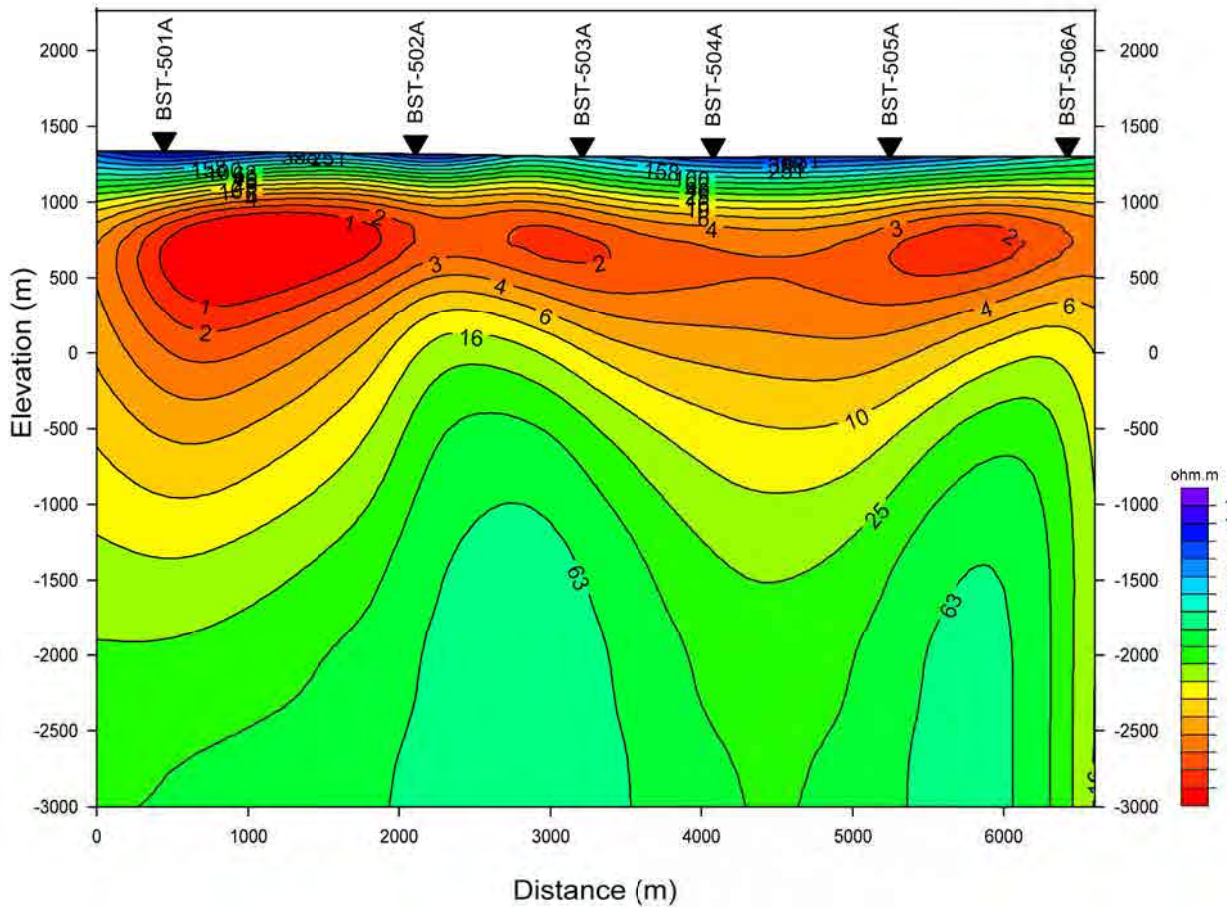


比抵抗分布断面图 (BST300)

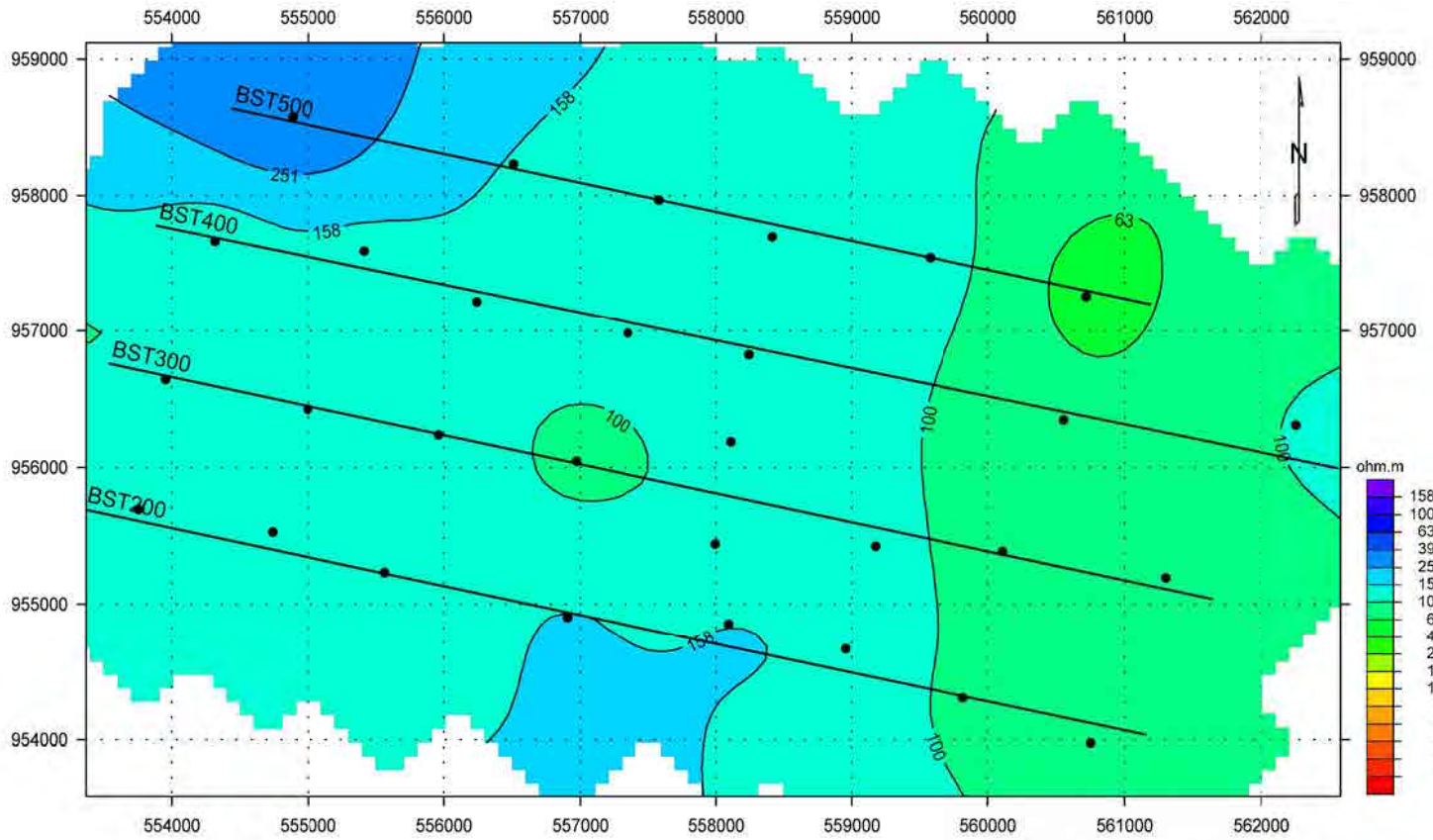




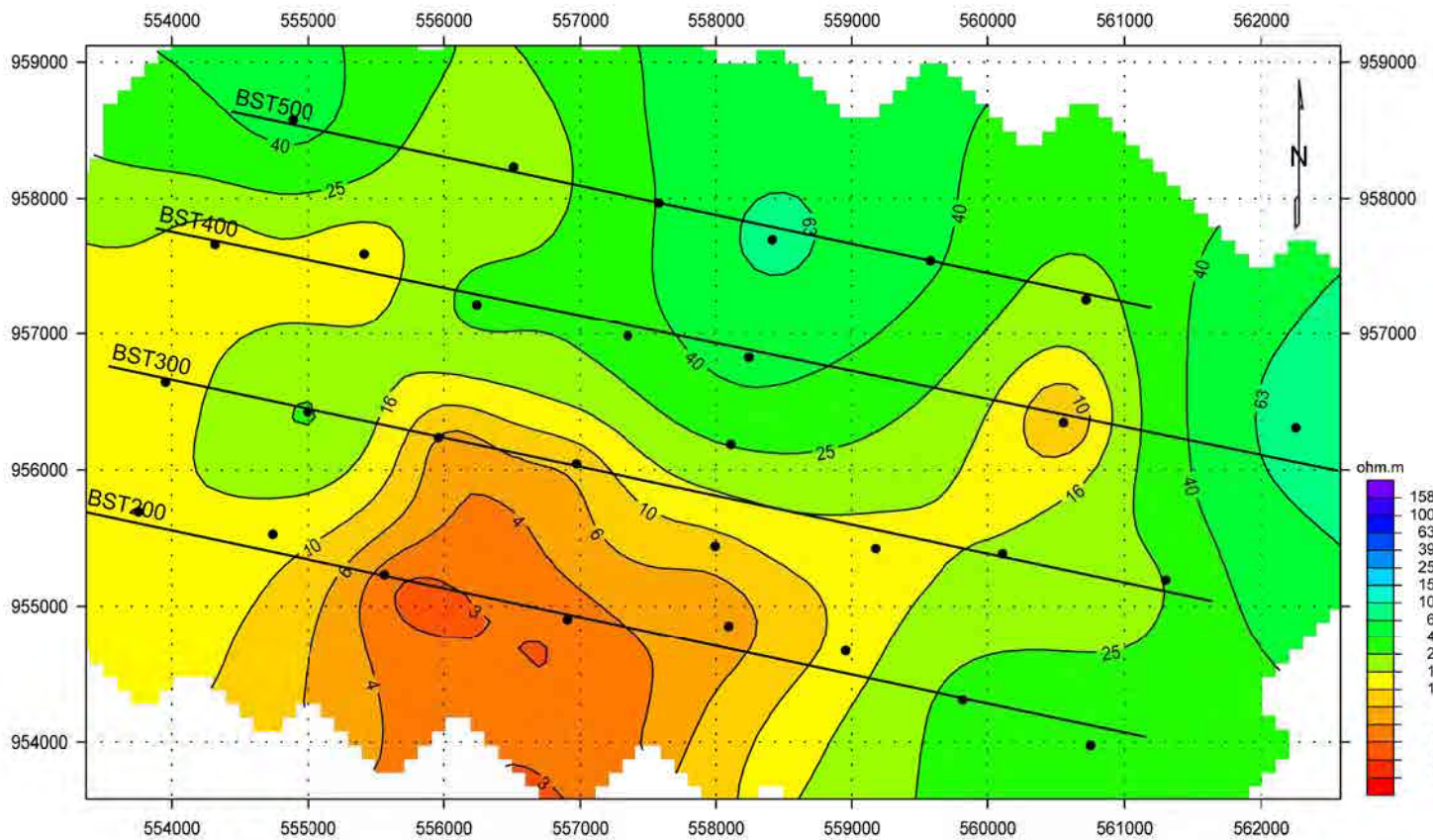
比抵抗分布断面图 (BST400)



比抵抗分布断面图 (BST500)

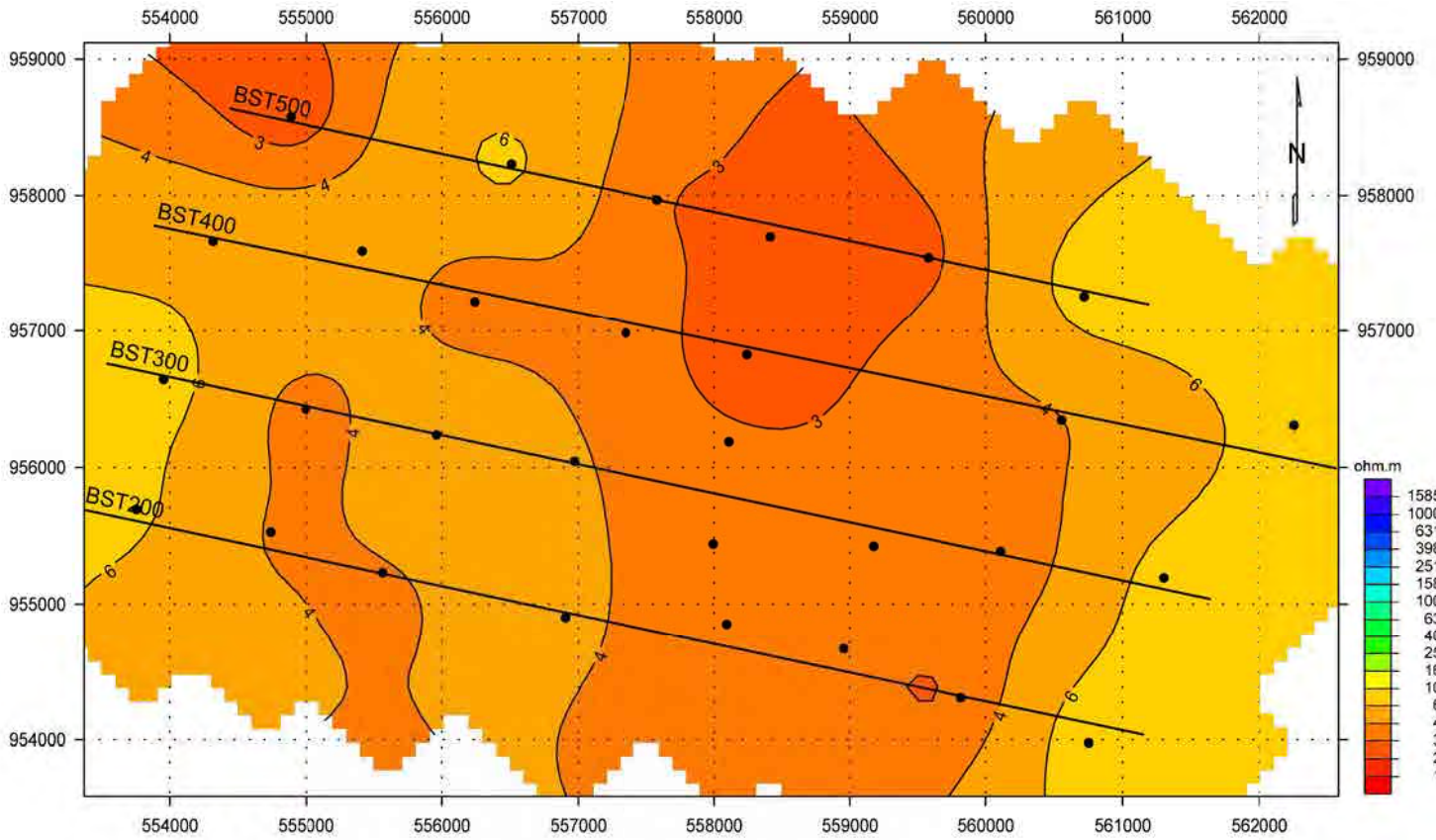


比抵抗分布平面図 (2Dモデル) 深度50m

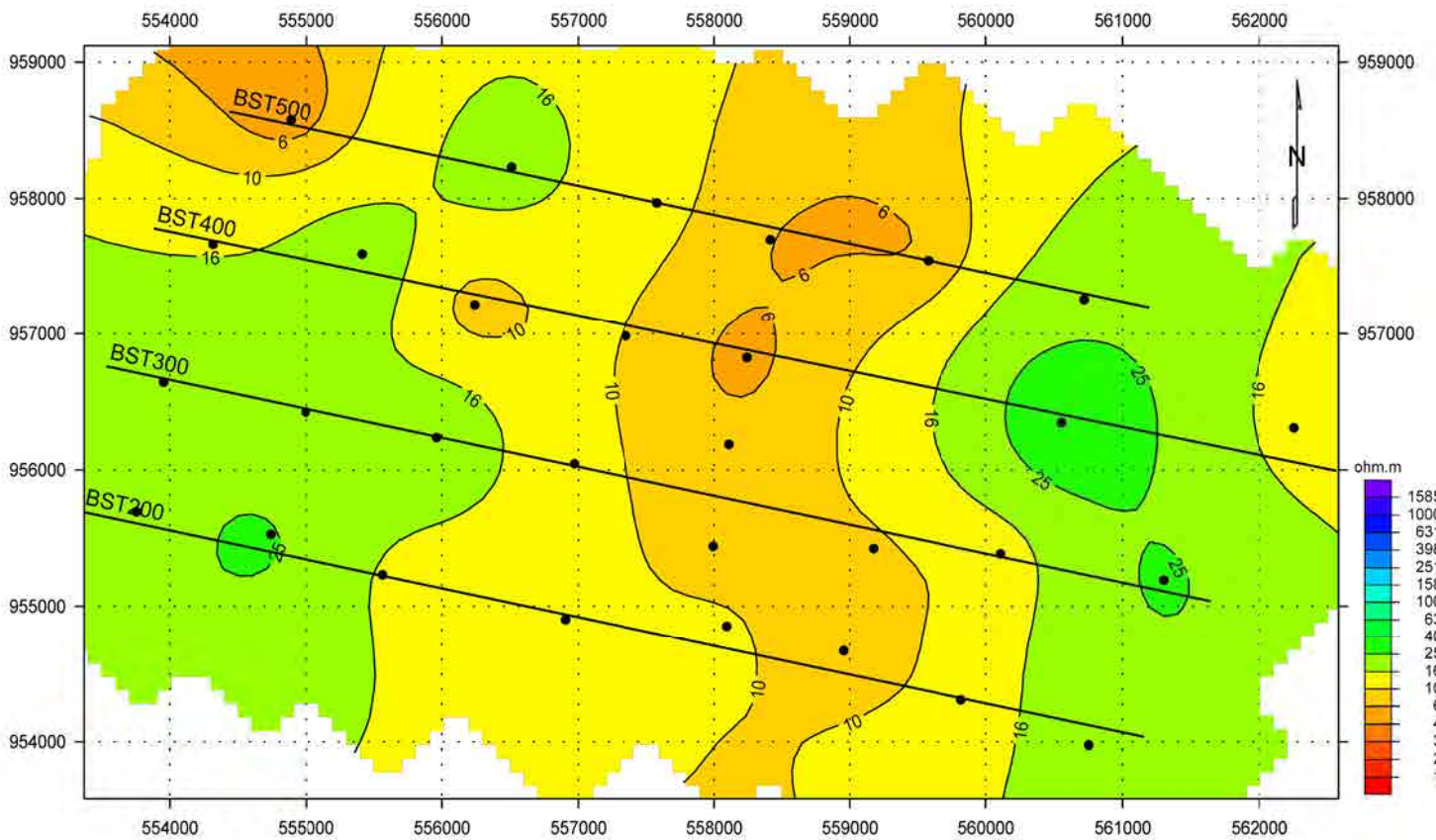


比抵抗分布平面図 (2Dモデル) 標高1200m

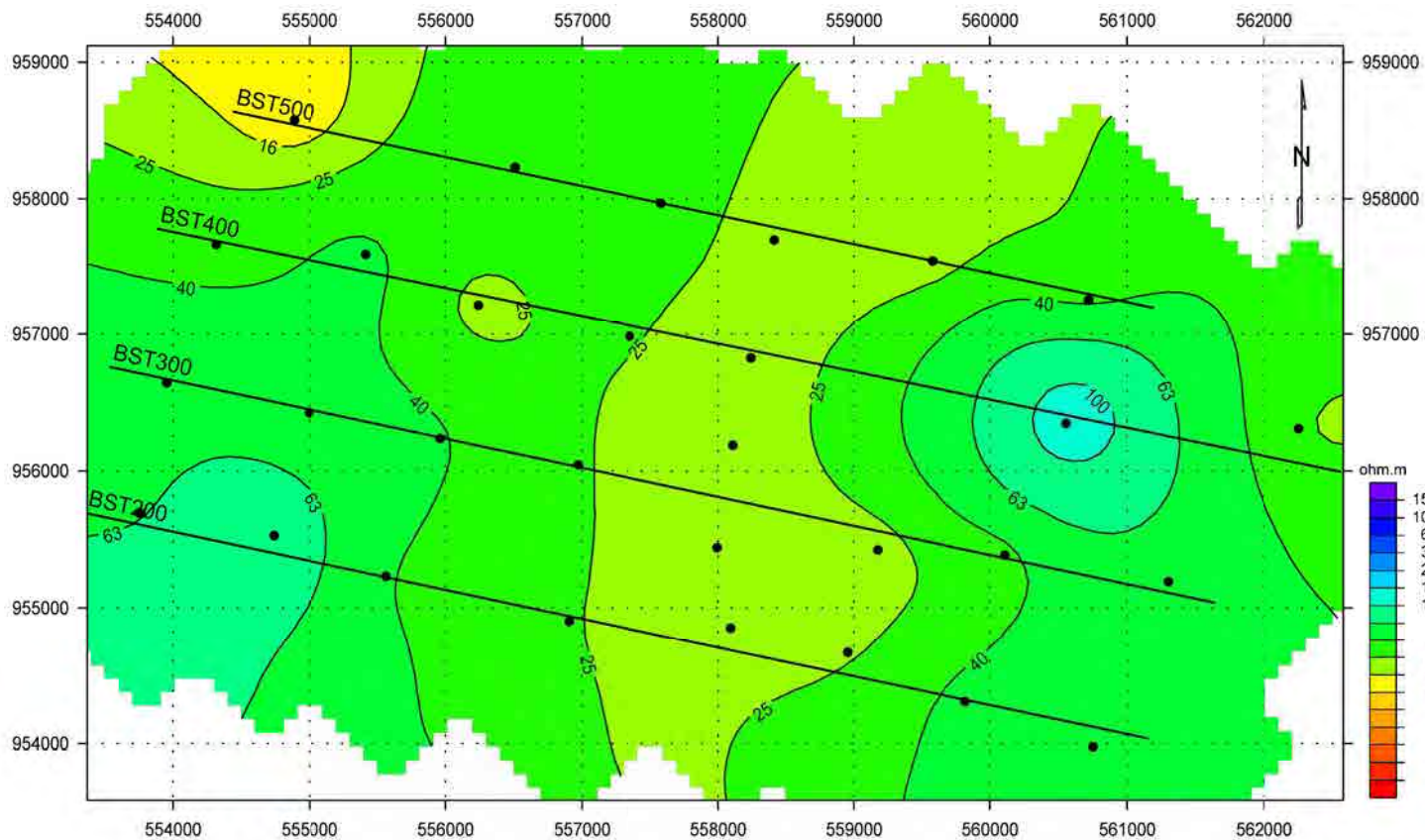




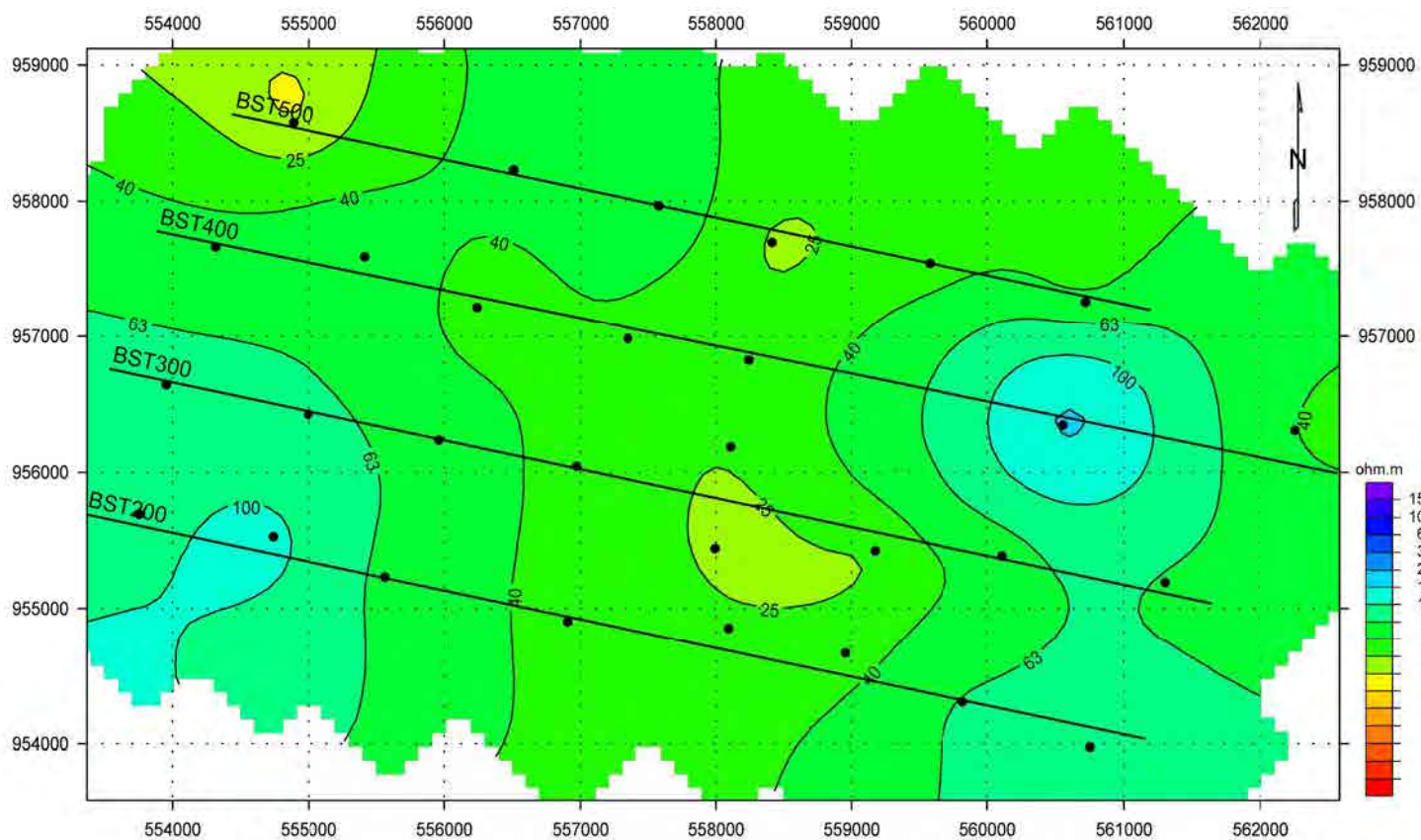
比抵抗分布平面図 (2Dモデル) 標高500m



比抵抗分布平面図 (2Dモデル) 標高0m

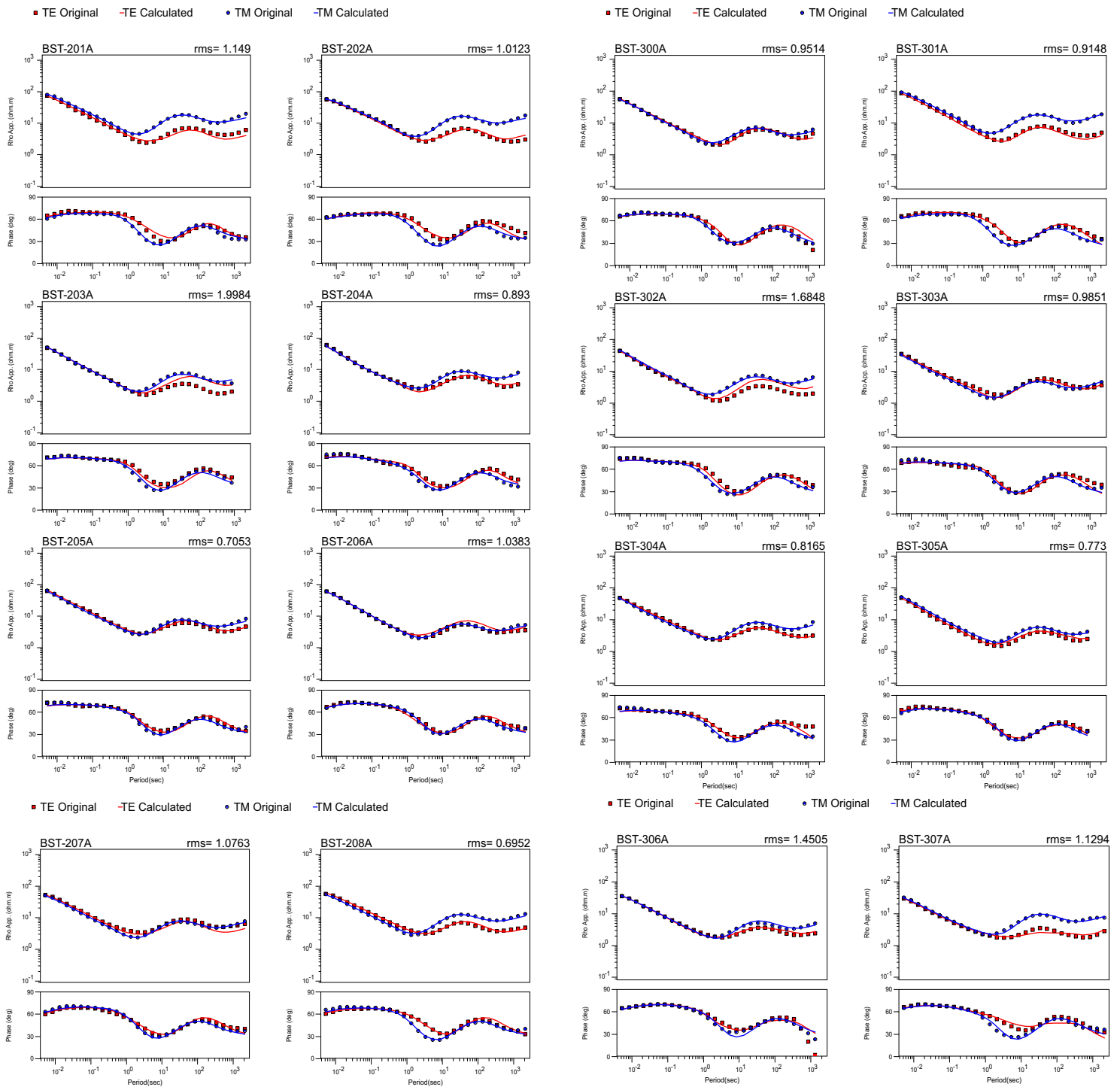


比抵抗分布平面図 (2Dモデル) 標高-500m

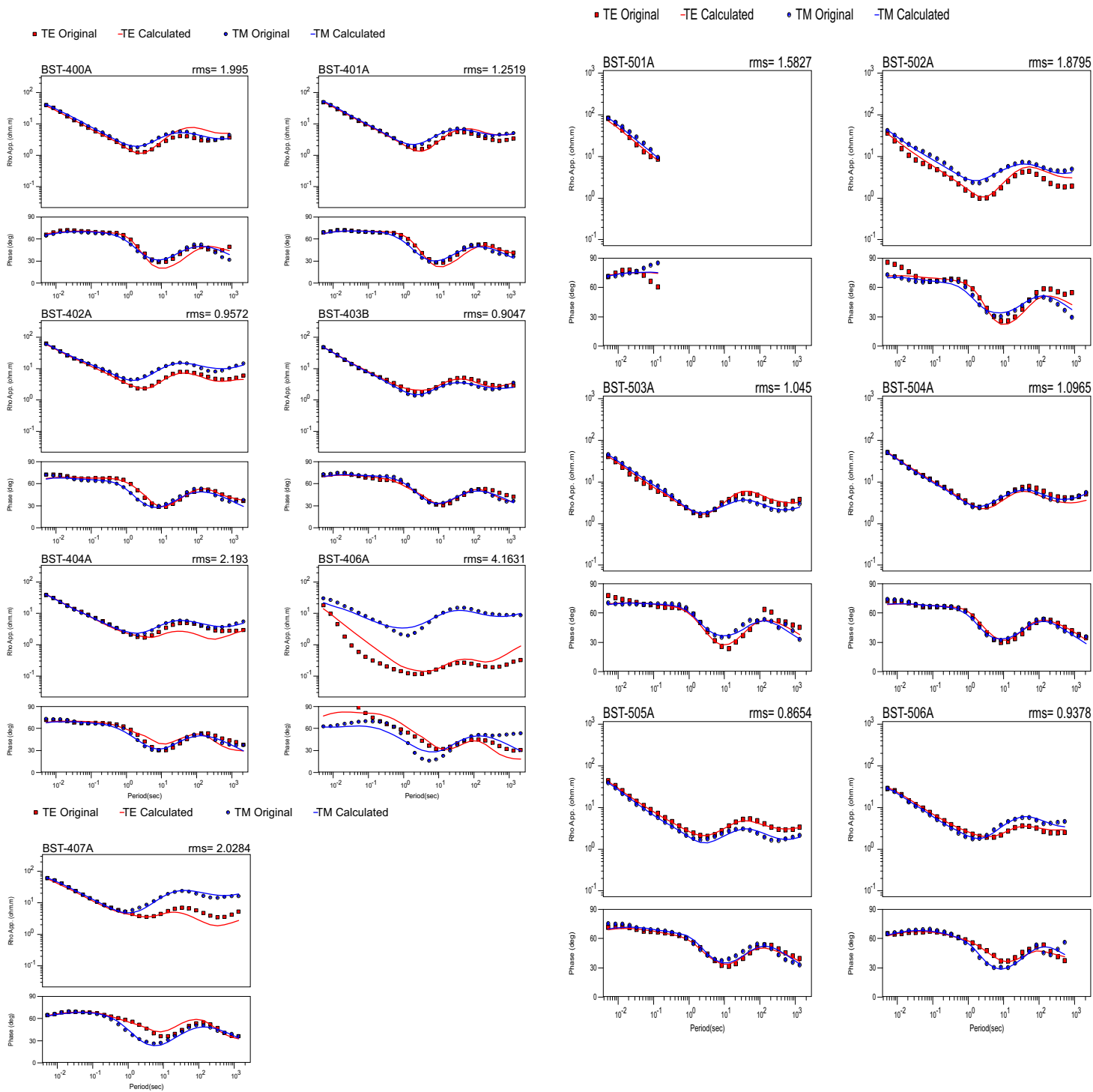


比抵抗分布平面図 (2Dモデル) 標高-1000m





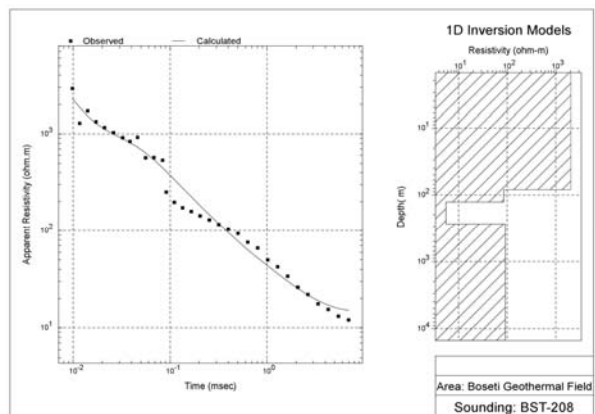
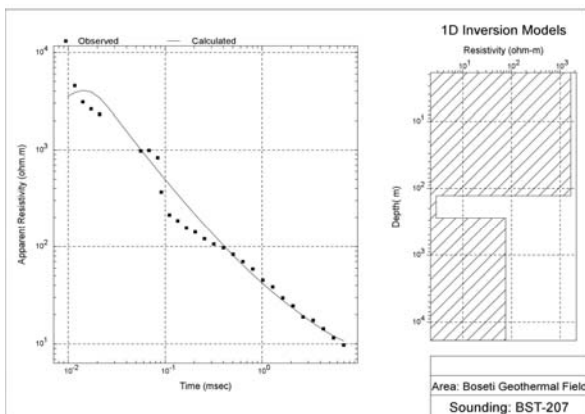
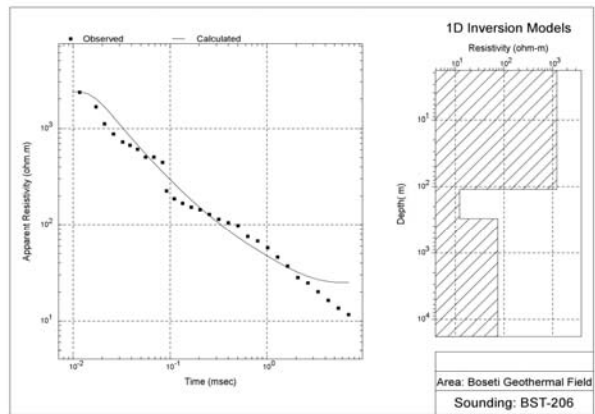
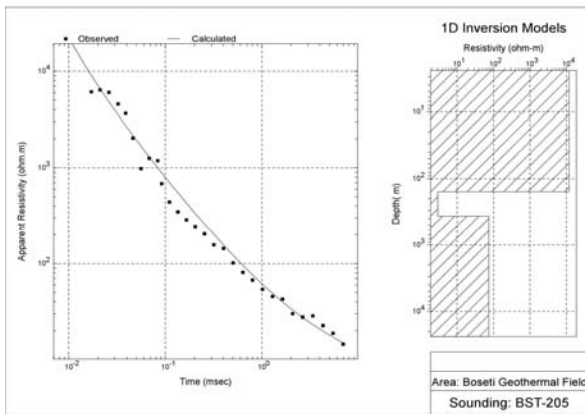
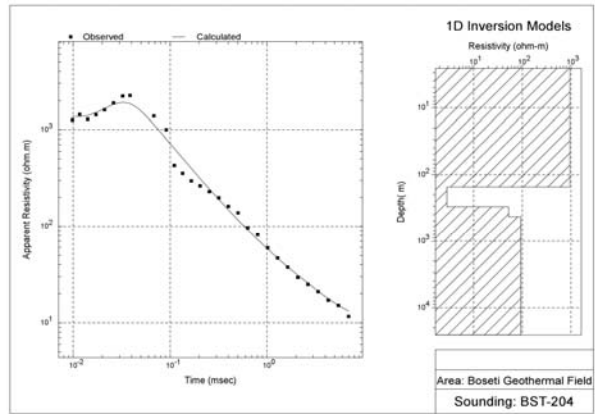
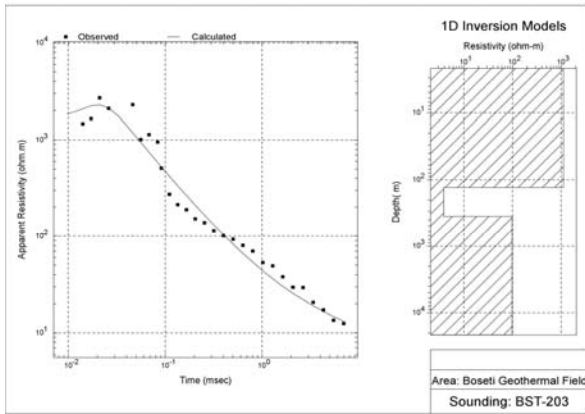
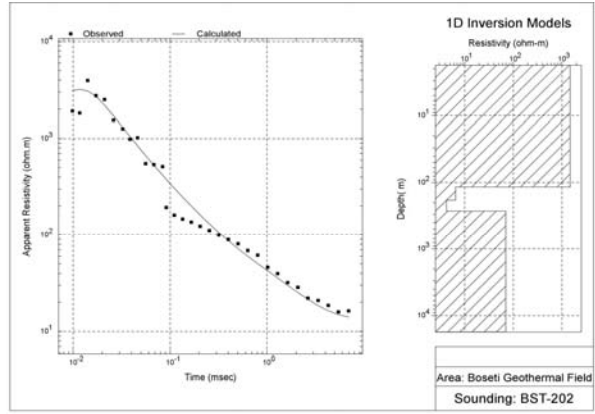
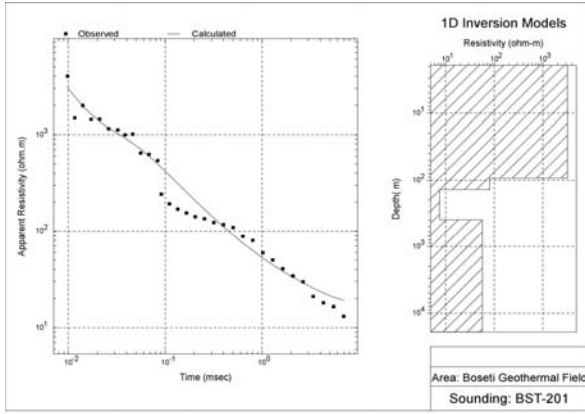
見掛比抵抗・位相曲線 (BST200, BST300)



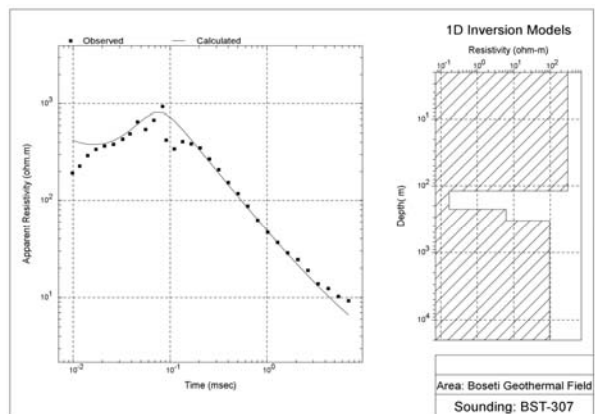
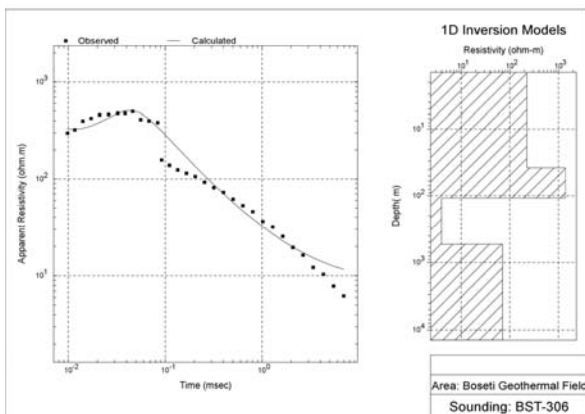
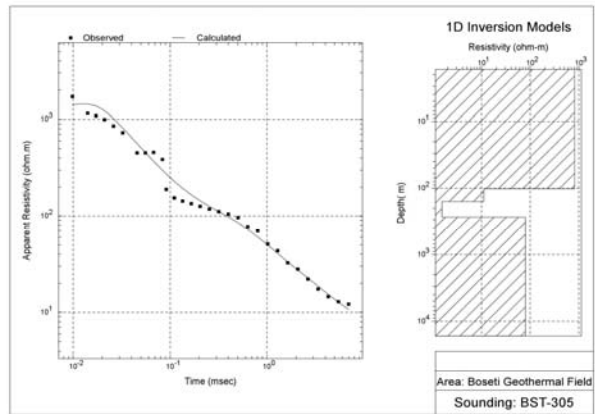
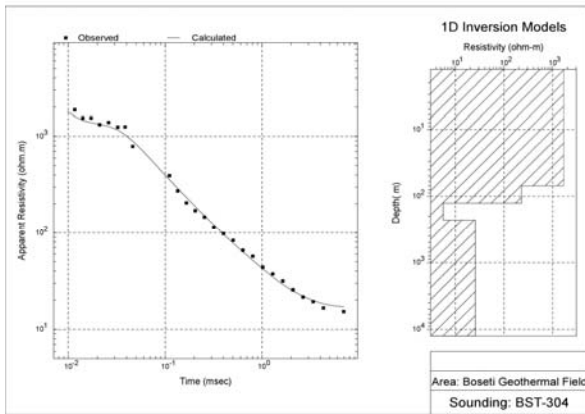
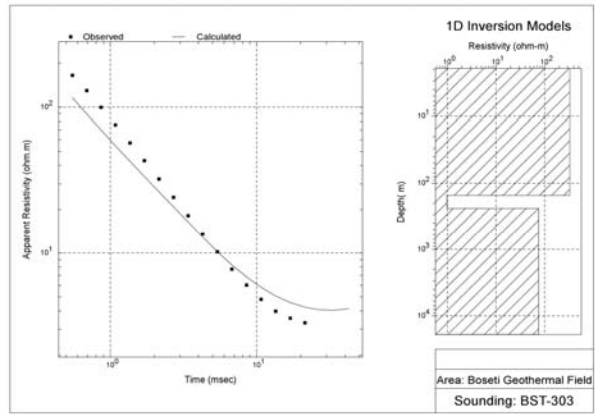
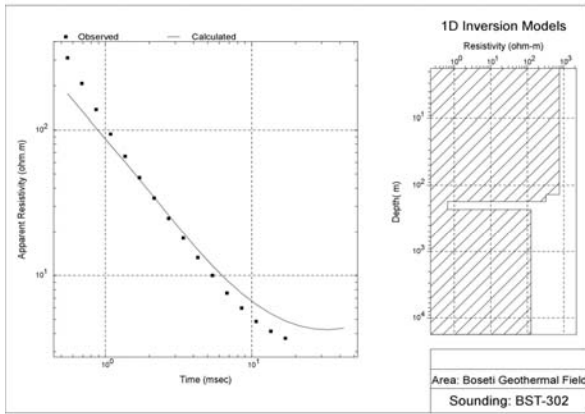
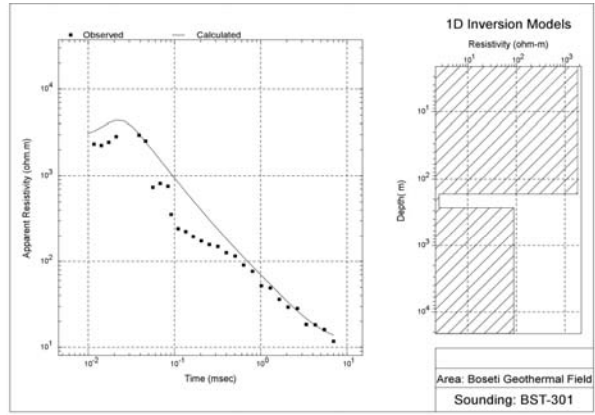
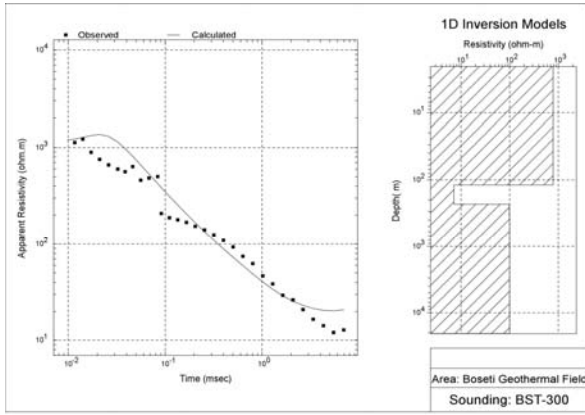
見掛比抵抗・位相曲線 (BST400, BST500)

スタティックシフト補正值一覧表

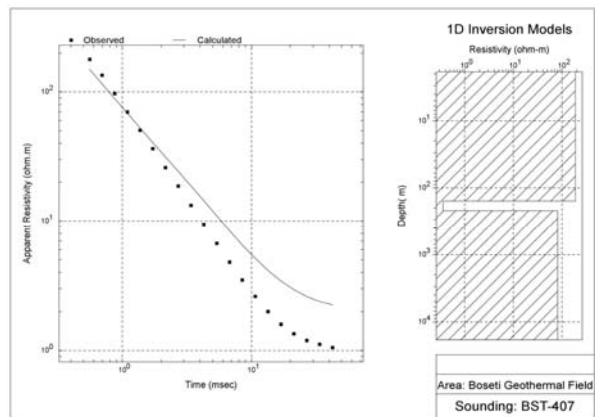
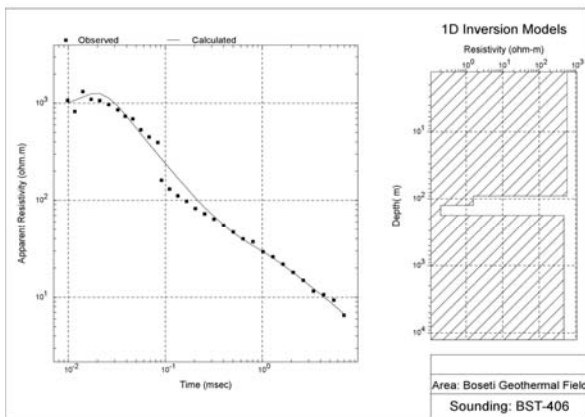
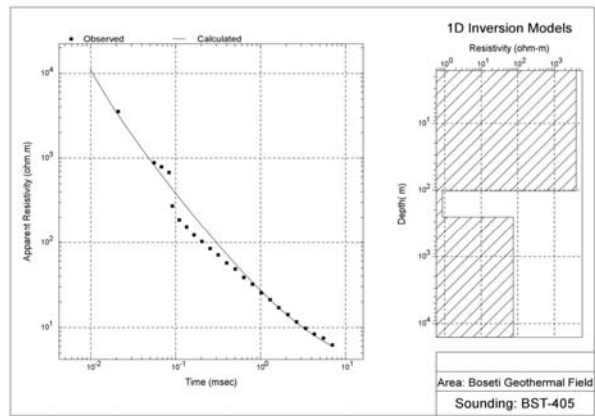
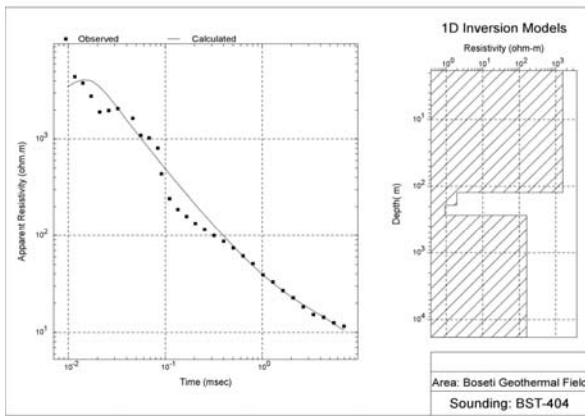
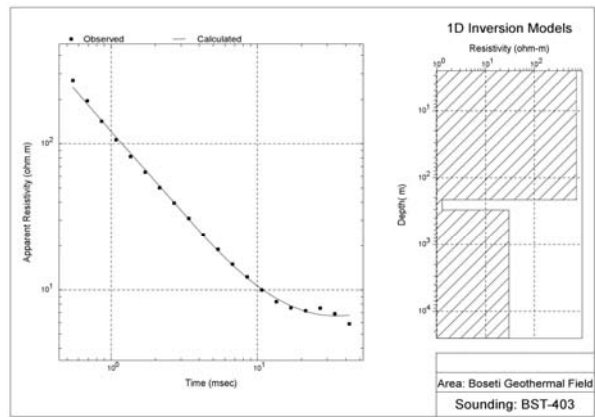
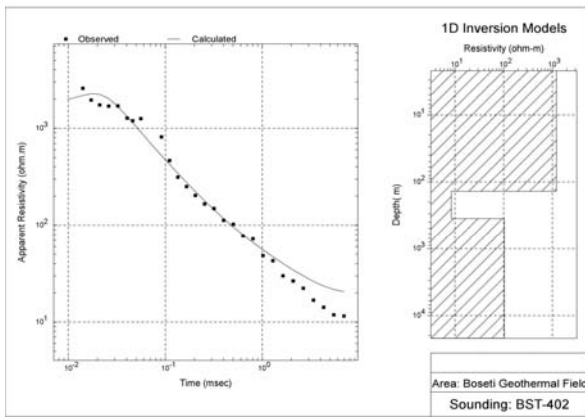
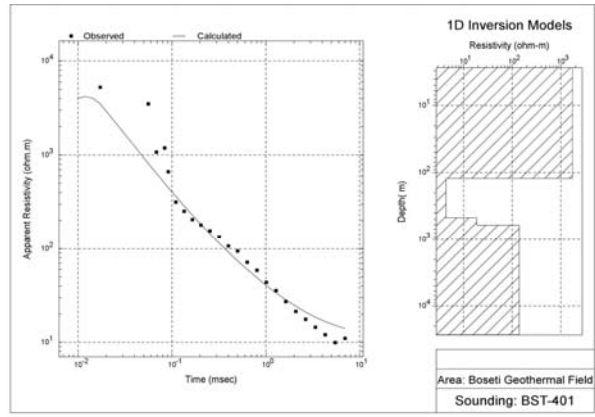
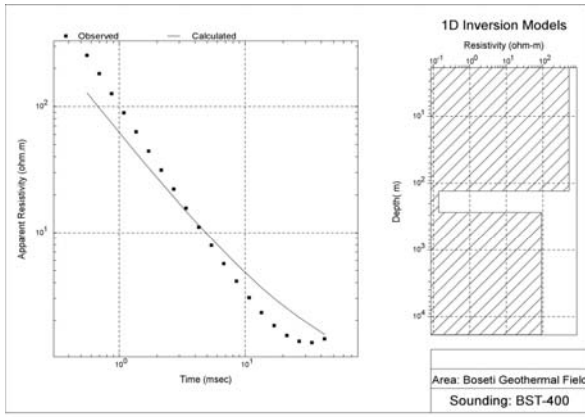
Station	Static Shift (xy)	Static Shift (yx)	Station	Static Shift (xy)	Static Shift (yx)
BST-201	0.329	0.190	BST-400	0.295	0.284
BST-202	0.330	0.258	BST-401	0.192	0.271
BST-203	0.799	0.384	BST-402	0.301	0.299
BST-204	0.454	0.871	BST-403	0.516	1.000
BST-205	0.477	0.273	BST-404	0.683	1.000
BST-206	0.638	0.527	BST-405	1.064	0.539
BST-207	0.241	0.252	BST-406	0.408	0.305
BST-208	0.161	0.298	BST-407	0.499	0.462
BST-300	0.363	0.270	BST-501	0.572	1.000
BST-301	0.536	0.641	BST-502	0.300	1.000
BST-302	0.271	0.300	BST-503	1.364	0.813
BST-303	0.170	0.377	BST-504	0.371	0.557
BST-304	0.521	1.000	BST-505	0.142	0.547
BST-305	0.238	0.257	BST-506	0.318	0.089
BST-306	0.595	0.334			
BST-307	0.363	0.199			



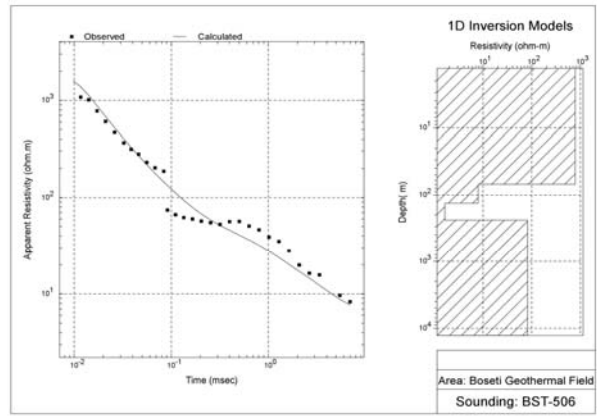
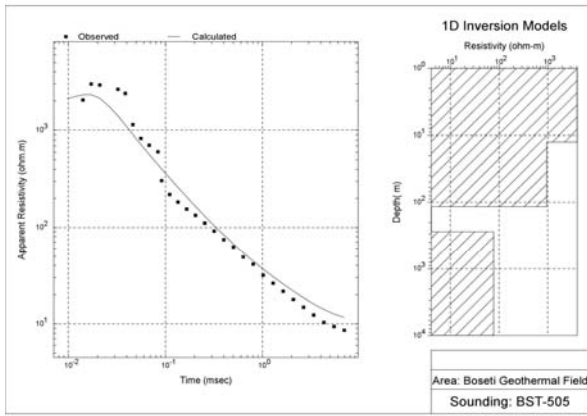
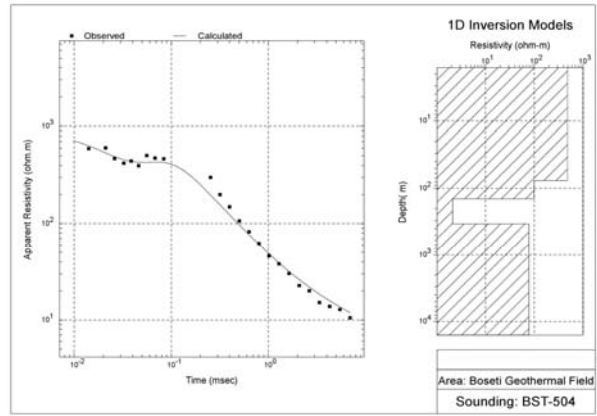
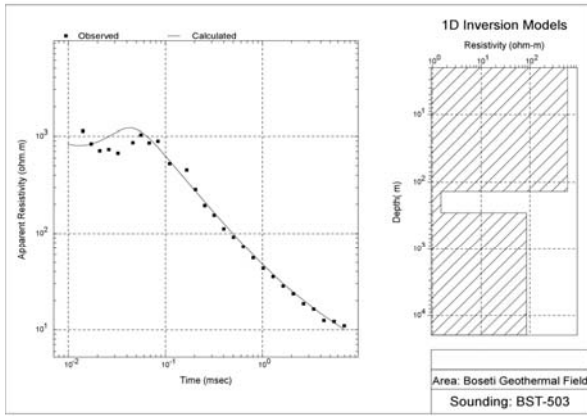
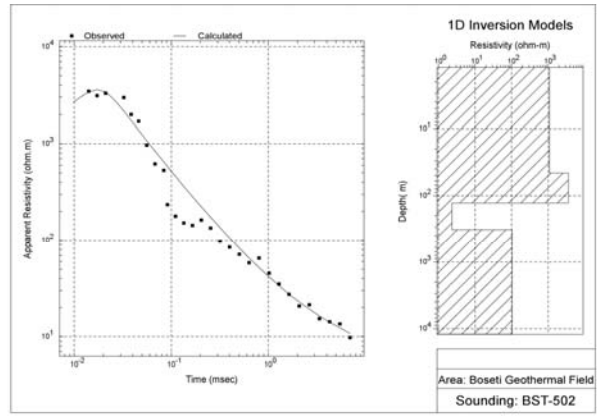
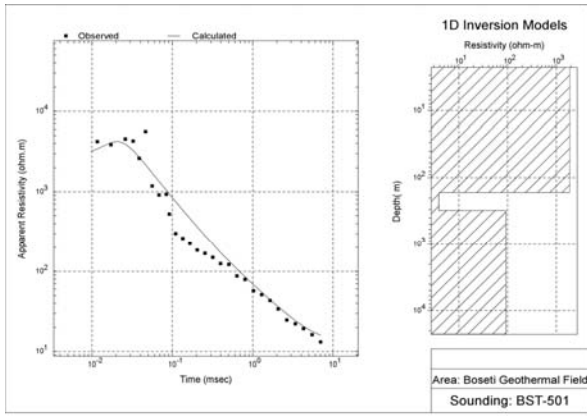
TEM法探査 1次元層構造解析結果 (BST200)



TEM法探査 1次元層構造解析結果 (BST300)



TEM法探査 1次元層構造解析結果 (BST400)



TEM法探査 1次元層構造解析結果 (BST500)

## APPENDIX-7

データベース格納データ





## データベース格納データ一覧

S/N	Classification	Test Type	Location	Measured by	Year	Remarks
1	Geological survey	Geological map	Aluto	METI	2010	Study on Geothermal Power Development Project in the Aluto Langano Field, Ethiopia
2	Geological survey	Geological map	Dalol, Boina	CNRS & CNR	????	Geological map of the Danakil Depression
3	Geological survey	Geological map	Tendaho, Damali, Danab, Meteka	CNRS & CNR	1975	Geological map of Central and Southern Afar
4	Geological survey	Geological map	Dofan	EMA	1993	Geological map of Debre Birhan
5	Geological survey	Geological map	Nazareth, Kone, Boseti, Gedemsa	GSE	????	Engineering Geological Map of Nazareth
6	Geological survey	Manifestation	13 sites	GSE	vary	Aluto, Danab, Dofan, Meteka, Teo, Fantale, Tendaho, Teo, Tulu Moye, Boseti, Gedemsa, Corbetti, Abaya
7	Geological survey	Manifestation	8 sites	JICA	2014	This study: Aluto, Gedemsa, Nazareth, Boseti, Kone, Dofan, Meteka, Tendaho
8	Remote sensing	Lineament	all	JICA	2014	This study
9	Remote sensing	Hydrothermal alternation	all	JICA	2014	This study
10	Remote sensing	Volcano	all	JICA	2014	This study
11	Remote sensing	Circular landform	all	JICA	2014	This study
12	Geophysical survey	MT survey	Aluto	METI	2010	Study on Geothermal Power Development Project in the Aluto Langano Field, Ethiopia
13	Geophysical survey	VES survey	Aluto	GSE	1982	
14	Geophysical survey	Gravity survey	Aluto	GSE	????	
15	Geophysical survey	Gravity survey	Abaya	GSE	????	
16	Geophysical survey	VES survey	Abaya	GSE	1983	
17	Geophysical survey	VES survey	Abaya	GSE	1993	
18	Geophysical survey	MT survey	Boseti	JICA & GSE	2014	This study
19	Geophysical survey	MT survey	Corbetti	RG	2012	Location only: Surface Exploration: Geology, geochemistry and resistivity report
20	Geophysical survey	Magnetic survey	Fantale	GSE	????	
21	Geophysical survey	Magnetic survey	Tulu Moye	GSE	????	
22	Geophysical survey	MT survey	Tendaho	JICA & GSE	2015	This study
23	Geophysical survey	MT survey	Tendaho	GSE	2014	Location only
24	Geophysical survey	MT survey	Tendaho	GSE	2013	ARGeo project
25	Geophysical survey	MT survey	Tendaho	GSE & BGR	2010~2012	Location only: GEOTHERM programme
26	Geophysical survey	MT survey	Tendaho	GSE & BGR	2006-2007	Location only: GEOTHERM programme
27	Geophysical survey	VES survey	Tendaho	Aquater	1980	
28	Geophysical survey	Magnetic survey	Tendaho	Aquater	1979	
29	Geophysical survey	Gravity survey	Tendaho	Aquater	1979	
30	Geophysical survey	Microseismic survey	Tendaho	Aquater	1995	Microseismic Survey Final Report
31	Geochemical survey	Geochemical analysis	8 sites	JICA	2014	This study: Aluto, Gedemsa, Nazareth, Boseti, Kone, Dofan, Meteka, Tendaho
32	Drilling survey	Drilling record*	Aluto	GSE	1982-1985	Final Drilling Report of LA-1~8
33	Drilling survey	Drilling record*	Aluto	GSE	????	Gradient well (IT-1~5)
34	Drilling survey	Drilling record*	Aluto	GSE	1982	Gradient well (TG-2~8,10~12)
35	Drilling survey	Drilling record*	Tendaho	Aquater	1994-95	TD-1~6 Drilling Report
36	Drilling survey	Drilling record*	Tendaho	Aquater	1980	Gradient well (GBH-1~9)

\*Well Data includes location, curve, casing program, geological column and permeable zone, etc.

BGR: Bundesanstalt für Geowissenschaften und Rohstoffe

CNRS: Centre National de la Recherche Scientifique

CNR: Consiglio Nazionale delle Ricerche

EMA: Ethiopian Map Agency

METI: Ministry of Economy, Trade and Industry

RG: Reykjavík Geothermal

## Well Logging Data in Aluto area

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
1	Well logging	Temperature logging	LA-1	Temperature	1982/10/14	1
2	Well logging	Temperature logging	LA-1	Temperature	1982/10/29	2
3	Well logging	Temperature logging	LA-1	Temperature	1983/1/20	3
4	Well logging	Temperature logging	LA-1	Temperature	1983/1/28	4
5	Well logging	Temperature logging	LA-1	Temperature	1983/7/7	5
6	Well logging	Temperature logging	LA-1	Temperature	1983/1/21	6
7	Well logging	Pressure test	LA-1	Pressure	1982/6/17	P2
8	Well logging	Pressure test	LA-1	Pressure	1982/6/25	P3
9	Well logging	Pressure test	LA-1	Pressure	1982/10/14	P5
10	Well logging	Temperature logging	LA-1	Temperature	1982/10/29	
11	Well logging	Temperature logging	LA-2	Temperature	1982/8/26	
12	Well logging	Pressure test	LA-2	Pressure	1982/11/15	
13	Well logging	Temperature logging	LA-3	Temperature	1983/3/19	T1
14	Well logging	Temperature logging	LA-3	Temperature	1983/3/19	T2
15	Well logging	Temperature logging	LA-3	Temperature	1983/3/20	T3
16	Well logging	Temperature logging	LA-3	Temperature	1983/4/29	T4
17	Well logging	Temperature logging	LA-3	Temperature	1983/5/5	T5
18	Well logging	Temperature logging	LA-3	Temperature	1983/5/6	T6
19	Well logging	Temperature logging	LA-3	Temperature	1983/5/6	T7
20	Well logging	Temperature logging	LA-3	Temperature	1983/5/7	T8
21	Well logging	Temperature logging	LA-3	Temperature	1983/5/9	T9
22	Well logging	Temperature logging	LA-3	Temperature	1983/5/10	T10
23	Well logging	Temperature logging	LA-3	Temperature	1983/5/10	T11
24	Well logging	Temperature logging	LA-3	Temperature	1983/5/17	T12
25	Well logging	Temperature logging	LA-3	Temperature	1983/5/18	T13
26	Well logging	Temperature logging	LA-3	Temperature	1983/5/19	T14
27	Well logging	Temperature logging	LA-3	Temperature	1983/5/20	T15
28	Well logging	Temperature logging	LA-3	Temperature	1983/6/13	T16
29	Well logging	Temperature logging	LA-3	Temperature	1983/6/14	T18
30	Well logging	Temperature logging	LA-3	Temperature	1983/6/16	T20
31	Well logging	Temperature logging	LA-3	Temperature	1983/6/17	T21
32	Well logging	Temperature logging	LA-3	Temperature	1983/6/17	T22
33	Well logging	Temperature logging	LA-3	Temperature	1983/6/18	T23
34	Well logging	Temperature logging	LA-3	Temperature	1983/6/19	T24
35	Well logging	Temperature logging	LA-3	Temperature	1983/6/22	T25
36	Well logging	Temperature logging	LA-3	Temperature	1983/6/25	T26
37	Well logging	Temperature logging	LA-3	Temperature	1983/6/28	T27
38	Well logging	Temperature logging	LA-3	Temperature	1983/7/2	T28
39	Well logging	Temperature logging	LA-3	Temperature	1983/7/10	T29
40	Well logging	Temperature logging	LA-3	Temperature	1983/7/16	T30
41	Well logging	Temperature logging	LA-3	Temperature	1983/8/1	T31
42	Well logging	Temperature logging	LA-3	Temperature	1983/8/6	T32
43	Well logging	Temperature logging	LA-3	Temperature	1983/8/15	T33
44	Well logging	Temperature logging	LA-3	Temperature	1983/8/29	T34
45	Well logging	Temperature logging	LA-3	Temperature	1983/9/14	T35
46	Well logging	Temperature logging	LA-3	Temperature	1983/9/26	T36
47	Well logging	Temperature logging	LA-3	Temperature	1983/10/4	T37
48	Well logging	Temperature logging	LA-3	Temperature	1983/10/8	T38
49	Well logging	Temperature logging	LA-3	Temperature	1983/10/11	T39
50	Well logging	Temperature logging	LA-3	Temperature	1983/10/17	T40
51	Well logging	Temperature logging	LA-3	Temperature	1983/10/27	T41
52	Well logging	Temperature logging	LA-3	Temperature	1983/11/2	T42
53	Well logging	Temperature logging	LA-3	Temperature	1983/11/10	T43
54	Well logging	Temperature logging	LA-3	Temperature	1983/11/24	T44
55	Well logging	Temperature logging	LA-3	Temperature	1983/11/29	T45
56	Well logging	Temperature logging	LA-3	Temperature	1983/12/3	T46
57	Well logging	Temperature logging	LA-3	Temperature	1983/4/25	T47
58	Well logging	Temperature logging	LA-3	Temperature	1984/4/30	T48

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
59	Well logging	Temperature logging	LA-3	Temperature	1984/5/2	T49
60	Well logging	Temperature logging	LA-3	Temperature	1984/5/3	T50
61	Well logging	Temperature logging	LA-3	Temperature	1984/6/8	T51
62	Well logging	Temperature logging	LA-3	Temperature	1984/6/12	T52
63	Well logging	Temperature logging	LA-3	Temperature	1984/6/19	T53
64	Well logging	Temperature logging	LA-3	Temperature	1984/12/21	Max. Therm.
65	Well logging	Temperature logging	LA-3	Temperature	1984/12/29	T54
66	Well logging	Temperature logging	LA-3	Temperature	1984/12/30	T54B
67	Well logging	Temperature logging	LA-3	Temperature	1985/1/8	T55
68	Well logging	Temperature logging	LA-3	Temperature	1985/4/21	T56
69	Well logging	Temperature logging	LA-3	Temperature	1985/6/23	T57
70	Well logging	Temperature logging	LA-3	Temperature	1985/7/2	T58
71	Well logging	Temperature logging	LA-3	Temperature	1985/7/4	T59
72	Well logging	Temperature logging	LA-3	Temperature	1985/7/6	T60
73	Well logging	Temperature logging	LA-3	Temperature	1985/7/10	T61
74	Well logging	WHP	LA-3	WHP	1984/6/15	WHP
75	Well logging	Pressure test	LA-3	Pressure	1983/3/20	P1
76	Well logging	Pressure test	LA-3	Pressure	1983/4/1	P2
77	Well logging	Pressure test	LA-3	Pressure	1983/4/29	P3
78	Well logging	Pressure test	LA-3	Pressure	1983/5/17	P4
79	Well logging	Pressure test	LA-3	Pressure	1983/6/13	P6
80	Well logging	Pressure test	LA-3	Pressure	1983/6/16	P9
81	Well logging	Pressure test	LA-3	Pressure	1983/6/17	P10
82	Well logging	Pressure test	LA-3	Pressure	1983/6/17	P11
83	Well logging	Pressure test	LA-3	Pressure	1983/6/15	P12
84	Well logging	Pressure test	LA-3	Pressure	1983/6/19	P13
85	Well logging	Pressure test	LA-3	Pressure	1983/6/21	P14
86	Well logging	Pressure test	LA-3	Pressure	1983/6/22	P15
87	Well logging	Pressure test	LA-3	Pressure	1983/6/25	P16
88	Well logging	Pressure test	LA-3	Pressure	1983/6/28	P17
89	Well logging	Pressure test	LA-3	Pressure	1983/7/10	P18
90	Well logging	Pressure test	LA-3	Pressure	1983/7/16	P19
91	Well logging	Pressure test	LA-3	Pressure	1983/8/1	P20
92	Well logging	Pressure test	LA-3	Pressure	1983/8/6	P21
93	Well logging	Pressure test	LA-3	Pressure	1983/8/15	P22
94	Well logging	Pressure test	LA-3	Pressure	1983/8/29	P23
95	Well logging	Pressure test	LA-3	Pressure	1983/9/14	P24
96	Well logging	Pressure test	LA-3	Pressure	1983/9/26	P25
97	Well logging	Pressure test	LA-3	Pressure	1983/10/4	P26
98	Well logging	Pressure test	LA-3	Pressure	1983/10/5	P27
99	Well logging	Pressure test	LA-3	Pressure	1983/10/8	P28
100	Well logging	Pressure test	LA-3	Pressure	1983/10/11	P29
101	Well logging	Pressure test	LA-3	Pressure	1983/10/17	P30
102	Well logging	Pressure test	LA-3	Pressure	1983/10/27	P31
103	Well logging	Pressure test	LA-3	Pressure	1983/11/2	P32
104	Well logging	Pressure test	LA-3	Pressure	1983/11/10	P33
105	Well logging	Pressure test	LA-3	Pressure	1983/11/24	P34
106	Well logging	Pressure test	LA-3	Pressure	1983/11/29	P35
107	Well logging	Pressure test	LA-3	Pressure	1983/12/3	P36
108	Well logging	Pressure test	LA-3	Pressure	1984/4/27	P37
109	Well logging	Pressure test	LA-3	Pressure	1984/4/29	P38
110	Well logging	Pressure test	LA-3	Pressure	1984/5/3	P39
111	Well logging	Pressure test	LA-3	Pressure	1984/5/4	P40
112	Well logging	Pressure test	LA-3	Pressure	1984/6/4	P41
113	Well logging	Pressure test	LA-3	Pressure	1984/6/5	P42
114	Well logging	Pressure test	LA-3	Pressure	1984/6/6	P43
115	Well logging	Pressure test	LA-3	Pressure	1984/6/8	P44
116	Well logging	Pressure test	LA-3	Pressure	1984/6/13	P45
117	Well logging	Pressure test	LA-3	Pressure	1984/6/19	P46

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
118	Well logging	Pressure test	LA-3	Pressure	1984/6/22	P47
119	Well logging	Pressure test	LA-3	Pressure	1984/12/30	P48
120	Well logging	Pressure test	LA-3	Pressure	1985/4/21	P49A
121	Well logging	Pressure test	LA-3	Pressure	1985/4/21	P49B
122	Well logging	Pressure test	LA-3	Pressure	1985/6/23	P50
123	Well logging	Pressure test	LA-3	Pressure	1985/7/2	P53
124	Well logging	Pressure test	LA-3	Pressure	1985/7/4	P54
125	Well logging	Pressure test	LA-3	Pressure	1985/7/6	P55
126	Well logging	Pressure test	LA-3	Pressure	1985/7/7	P55A
127	Well logging	Pressure test	LA-3	Pressure	1985/7/8	P55B
128	Well logging	Pressure test	LA-3	Pressure	1985/7/10	P56
129	Well logging	Pressure test	LA-3	Pressure	1987/12/29	P57
130	Well logging	Pressure test	LA-3	Pressure	1988/7/27	P58
131	Well logging	Temperature logging	LA-3	Temperature	2006/5/31	Kuster
132	Well logging	Temperature logging	LA-3	Temperature	2006/5/31	Kuster
133	Well logging	Pressure test	LA-3	Pressure	1985/7/14	Interference Test
134	Well logging	Pressure test	LA-3	Pressure	1983/6/15	Injection-Falloff
135	Well logging	Temperature logging	LA-3	Enthalpy	1985/4/28	Flow Test1
136	Well logging	Temperature logging	LA-3	WHP	1984/5/17	Flow Test2
137	Well logging	Pressure test	LA-3	Pressure	1984/5/17	Flow Test3
138	Well logging	Temperature logging	LA-3	Weir H	1984/5/17	Flow Test4
139	Well logging	Temperature logging	LA-3	WPH	1985/6/28	Flow Test5
140	Well logging	Temperature logging	LA-3	Total Mass Flow (T m	1985/6/28	Flow Test6
141	Well logging	Temperature logging	LA-3	Enthalpy	1985/6/28	Flow Test7
142	Well logging	Pressure test	LA-3	Pressure	1985/6/28	Flow Test8
143	Well logging	Pressure test	LA-3	Pressure	1984/6/4	Build-up Test1
144	Well logging	Pressure test	LA-3	Pressure	1985/7/1	Build-up Test2
145	Well logging	Temperature logging	LA-4	Temperature	1983/10/3	T1
146	Well logging	Temperature logging	LA-4	Temperature	1983/10/3	T2
147	Well logging	Temperature logging	LA-4	Temperature	1983/10/3	T3
148	Well logging	Temperature logging	LA-4	Temperature	1983/10/3	T4
149	Well logging	Temperature logging	LA-4	Temperature	1983/10/20	T5
150	Well logging	Temperature logging	LA-4	Temperature	1983/10/21	T6
151	Well logging	Temperature logging	LA-4	Temperature	1983/10/23	T7
152	Well logging	Temperature logging	LA-4	Temperature	1983/10/24	T8
153	Well logging	Temperature logging	LA-4	Temperature	1983/10/25	T9
154	Well logging	Temperature logging	LA-4	Temperature	1983/10/28	T10
155	Well logging	Temperature logging	LA-4	Temperature	1983/10/31	T11
156	Well logging	Temperature logging	LA-4	Temperature	1983/11/4	T12
157	Well logging	Temperature logging	LA-4	Temperature	1983/11/12	T13
158	Well logging	Temperature logging	LA-4	Temperature	1983/11/23	T14
159	Well logging	Temperature logging	LA-4	Temperature	1983/12/1	T15
160	Well logging	Temperature logging	LA-4	Temperature	1983/12/12	T16
161	Well logging	Temperature logging	LA-4	Temperature	1983/12/26	T17
162	Well logging	Temperature logging	LA-4	Temperature	1984/1/2	T18
163	Well logging	Temperature logging	LA-4	Temperature	1984/1/4	T19
164	Well logging	Temperature logging	LA-4	Temperature	1984/1/6	T20
165	Well logging	Temperature logging	LA-4	Temperature	1984/1/9	T21
166	Well logging	Temperature logging	LA-4	Temperature	1984/1/22	T22
167	Well logging	Temperature logging	LA-4	Temperature	1984/4/13	T23A
168	Well logging	Temperature logging	LA-4	Temperature	1984/4/14	T23B
169	Well logging	Temperature logging	LA-4	Temperature	1984/4/17	T24A
170	Well logging	Temperature logging	LA-4	Temperature	1984/4/18	T24B
171	Well logging	Temperature logging	LA-4	Temperature	1984/4/19	T25
172	Well logging	Temperature logging	LA-4	Temperature	1984/4/20	T26A
173	Well logging	Temperature logging	LA-4	Temperature	1984/4/20	T26B
174	Well logging	Temperature logging	LA-4	Temperature	1984/6/25	T27A
175	Well logging	Temperature logging	LA-4	Temperature	1984/6/27	T27B
176	Well logging	Temperature logging	LA-4	Temperature	1984/7/15	T28B



S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
177	Well logging	Temperature logging	LA-4	Temperature	1984/10/9	T29
178	Well logging	Temperature logging	LA-4	Temperature	1984/10/30	T30
179	Well logging	Temperature logging	LA-4	Temperature	1985/3/26	T31
180	Well logging	Temperature logging	LA-4	Temperature	1985/4/2	T32
181	Well logging	Temperature logging	LA-4	Temperature	1985/5/15	T33
182	Well logging	Temperature logging	LA-4	Temperature	1985/5/17	T34
183	Well logging	WHP	LA-4	WHP	1985/1/27	WHP
184	Well logging	Pressure test	LA-4	Pressure	1983/9/21	P1
185	Well logging	Pressure test	LA-4	Pressure	1983/3/10	P2
186	Well logging	Pressure test	LA-4	Pressure	1983/10/21	P3
187	Well logging	Pressure test	LA-4	Pressure	1983/10/23	P6
188	Well logging	Pressure test	LA-4	Pressure	1983/10/24	P7
189	Well logging	Pressure test	LA-4	Pressure	1983/10/25	P8
190	Well logging	Pressure test	LA-4	Pressure	1983/10/26	P9
191	Well logging	Pressure test	LA-4	Pressure	1983/10/28	P10
192	Well logging	Pressure test	LA-4	Pressure	1983/10/31	P11
193	Well logging	Pressure test	LA-4	Pressure	1983/4/11	P12
194	Well logging	Pressure test	LA-4	Pressure	1983/12/11	P13
195	Well logging	Pressure test	LA-4	Pressure	1983/11/23	P14
196	Well logging	Pressure test	LA-4	Pressure	1983/1/12	P15
197	Well logging	Pressure test	LA-4	Pressure	1983/12/12	P16
198	Well logging	Pressure test	LA-4	Pressure	1983/12/23	P17
199	Well logging	Pressure test	LA-4	Pressure	1984/2/1	P18
200	Well logging	Pressure test	LA-4	Pressure	1984/4/1	P19
201	Well logging	Pressure test	LA-4	Pressure	1984/6/1	P20
202	Well logging	Pressure test	LA-4	Pressure	1984/1/22	P21
203	Well logging	Pressure test	LA-4	Pressure	1984/4/13	P22
204	Well logging	Pressure test	LA-4	Pressure	1984/4/16	P23
205	Well logging	Pressure test	LA-4	Pressure	1984/4/17	P24
206	Well logging	Pressure test	LA-4	Pressure	1984/4/21	P25
207	Well logging	Pressure test	LA-4	Pressure	1984/6/24	P26B
208	Well logging	Pressure test	LA-4	Pressure	1984/6/25	P27
209	Well logging	Pressure test	LA-4	Pressure	1984/6/27	P28
210	Well logging	Pressure test	LA-4	Pressure	1984/6/29	P29
211	Well logging	Pressure test	LA-4	Pressure	1984/7/14	P30
212	Well logging	Pressure test	LA-4	Pressure	1984/9/10	P31
213	Well logging	Pressure test	LA-4	Pressure	1985/3/27	P32
214	Well logging	Pressure test	LA-4	Pressure	1985/5/15	P33
215	Well logging	Pressure test	LA-4	Pressure	1987/12/24	P34
216	Well logging	Pressure test	LA-4	Pressure	1986/7/29	P35
217	Well logging	Temperature logging	LA-4	Temperature	2006/6/1	Kuster
218	Well logging	Pressure test	LA-4	Pressure	2006/6/1	Kuster
219	Well logging	Pressure test	LA-4	Pressure	1984/10/22	Injection-Falloff
220	Well logging	Temperature logging	LA-4	WPH	1984/11/27	Discharge Test 1
221	Well logging	Temperature logging	LA-4	Flow Rate	1984/11/27	Discharge Test 1
222	Well logging	Temperature logging	LA-4	Enthalpy	1984/11/27	Discharge Test 1
223	Well logging	Pressure test	LA-4	Pressure	1984/6/4	Build-up test
224	Well logging	Temperature logging	LA-5	Temperature	1984/2/4	T1
225	Well logging	Temperature logging	LA-5	Temperature	1984/2/4	T2
226	Well logging	Temperature logging	LA-5	Temperature	1984/2/5	T3
227	Well logging	Temperature logging	LA-5	Temperature	1984/2/7	T4
228	Well logging	Temperature logging	LA-5	Temperature	1984/2/9	T5
229	Well logging	Temperature logging	LA-5	Temperature	1984/2/10	T6
230	Well logging	Temperature logging	LA-5	Temperature	1984/2/11	T7
231	Well logging	Temperature logging	LA-5	Temperature	1984/3/23	T8
232	Well logging	Temperature logging	LA-5	Temperature	1984/3/26	T9
233	Well logging	Temperature logging	LA-5	Temperature	1984/3/28	T10
234	Well logging	Temperature logging	LA-5	Temperature	1984/4/6	T11
235	Well logging	Temperature logging	LA-5	Temperature	1984/5/1	T12

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
236	Well logging	Temperature logging	LA-5	Temperature	1984/6/1	T13
237	Well logging	Temperature logging	LA-5	Temperature	1984/6/30	T14
238	Well logging	Temperature logging	LA-5	Temperature	1984/12/13	T15
239	Well logging	Temperature logging	LA-5	Temperature	1984/12/13	T-Max
240	Well logging	Temperature logging	LA-5	Temperature	1984/12/14	T16
241	Well logging	Temperature logging	LA-5	Temperature	1984/12/14	T17
242	Well logging	Temperature logging	LA-5	Temperature	1984/12/19	T18
243	Well logging	Temperature logging	LA-5	Temperature	1984/6/18	T19
244	Well logging	Temperature logging	LA-5	Temperature	1984/6/20	T20
245	Well logging	Temperature logging	LA-5	Temperature	1984/7/30	T21
246	Well logging	Temperature logging	LA-5	Temperature	1984/8/9	T22
247	Well logging	Pressure test	LA-5	Pressure	1984/3/14	P1
248	Well logging	Pressure test	LA-5	Pressure	1984/3/15	* P2
249	Well logging	Pressure test	LA-5	Pressure	1984/2/3	* P4
250	Well logging	Pressure test	LA-5	Pressure	1984/3/23	* P5
251	Well logging	Pressure test	LA-5	Pressure	1984/3/26	* P6
252	Well logging	Pressure test	LA-5	Pressure	1984/4/28	* P7
253	Well logging	Pressure test	LA-5	Pressure	1984/5/4	P8
254	Well logging	Pressure test	LA-5	Pressure	1984/1/5	P9
255	Well logging	Pressure test	LA-5	Pressure	1984/12/15	P10
256	Well logging	Pressure test	LA-5	Pressure	1984/12/18	P11
257	Well logging	Pressure test	LA-5	Pressure	1985/7/31	P12
258	Well logging	Pressure test	LA-5	Pressure	1985/9/8	P13
259	Well logging	Pressure test	LA-5	Pressure	1985/9/8	P14
260	Well logging	Pressure test	LA-5	Pressure	1984/3/16	Injection-Falloff
261	Well logging	Temperature logging	LA-6	Temperature	1984/7/4	T2
262	Well logging	Temperature logging	LA-6	Temperature	1984/7/5	T3
263	Well logging	Temperature logging	LA-6	Temperature	1984/7/7	T4
264	Well logging	Temperature logging	LA-6	Temperature	1984/7/10	T5
265	Well logging	Temperature logging	LA-6	Temperature	1984/7/12	T6
266	Well logging	Temperature logging	LA-6	Temperature	1984/7/17	T7
267	Well logging	Temperature logging	LA-6	Temperature	1984/7/22	T8
268	Well logging	Temperature logging	LA-6	Temperature	1984/7/24	T9
269	Well logging	Temperature logging	LA-6	Temperature	1984/8/3	T10
270	Well logging	Temperature logging	LA-6	Temperature	1984/8/31	T11
271	Well logging	Temperature logging	LA-6	Temperature	1984/9/6	T12
272	Well logging	Temperature logging	LA-6	Temperature	1984/11/1	T13
273	Well logging	Temperature logging	LA-6	Temperature	1984/11/5	T14
274	Well logging	Temperature logging	LA-6	Temperature	1984/11/27	T15
275	Well logging	Temperature logging	LA-6	Temperature	1985/2/8	T16
276	Well logging	Temperature logging	LA-6	Temperature	1985/2/9	T17
277	Well logging	Temperature logging	LA-6	Temperature	1985/6/12	T18
278	Well logging	WHP	LA-6	WHP	1984/11/4	WHP
279	Well logging	Pressure test	LA-6	Pressure	1984/7/3	P1
280	Well logging	Pressure test	LA-6	Pressure	1984/7/5	P4
281	Well logging	Pressure test	LA-6	Pressure	1984/7/7	P5
282	Well logging	Pressure test	LA-6	Pressure	1984/7/10	P6
283	Well logging	Pressure test	LA-6	Pressure	1984/7/12	P7
284	Well logging	Pressure test	LA-6	Pressure	1984/7/17	P8
285	Well logging	Pressure test	LA-6	Pressure	1984/7/21	P9
286	Well logging	Pressure test	LA-6	Pressure	1984/7/22	P10
287	Well logging	Pressure test	LA-6	Pressure	1984/7/24	P11
288	Well logging	Pressure test	LA-6	Pressure	1984/8/21	P12
289	Well logging	Pressure test	LA-6	Pressure	1984/9/3	P13
290	Well logging	Pressure test	LA-6	Pressure	1984/11/1	P14
291	Well logging	Pressure test	LA-6	Pressure	1984/11/4	P15
292	Well logging	Pressure test	LA-6	Pressure	1984/11/6	P16
293	Well logging	Pressure test	LA-6	Pressure	1984/11/26	P17
294	Well logging	Pressure test	LA-6	Pressure	1985/6/12	P18

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
295	Well logging	Pressure test	LA-6	Pressure	1987/12/31	P19
296	Well logging	Pressure test	LA-6	Pressure	1988/7/18	P20
297	Well logging	Pressure test	LA-6	Pressure	1989/12/30	P21A
298	Well logging	Pressure test	LA-6	Pressure	1989/12/31	P21B
299	Well logging	Pressure test	LA-6	Pressure	1990/8/1	P22
300	Well logging	Pressure test	LA-6	Pressure	1990/3/2	P24
301	Well logging	Pressure test	LA-6	Pressure	1990/6/2	P25
302	Well logging	Pressure test	LA-6	Pressure	1990/2/14	P26
303	Well logging	Temperature logging	LA-6	Temperature	2006/5/30	Kuster
304	Well logging	Pressure test	LA-6	Pressure	2006/5/30	Kuster
305	Well logging	Pressure test	LA-6	Pressure	1984/7/3	Injection-Falloff
306	Well logging	Temperature logging	LA-6	WPH	1984/11/27	Discharge Test
307	Well logging	Temperature logging	LA-6	Flow Rate	1984/11/27	Discharge Test
308	Well logging	Temperature logging	LA-6	Enthalpy	1984/11/27	Discharge Test
309	Well logging	Temperature logging	LA-7	Temperature	1984/10/18	T1
310	Well logging	Temperature logging	LA-7	Temperature	1984/10/19	T2
311	Well logging	Temperature logging	LA-7	Temperature	1984/10/24	T4
312	Well logging	Temperature logging	LA-7	Temperature	1984/10/25	T5
313	Well logging	Temperature logging	LA-7	Temperature	1984/10/28	T6
314	Well logging	Temperature logging	LA-7	Temperature	1984/10/29	T7
315	Well logging	Temperature logging	LA-7	Temperature	1984/11/16	T8
316	Well logging	Temperature logging	LA-7	Temperature	1984/11/17	T9
317	Well logging	Temperature logging	LA-7	Temperature	1984/11/19	T10
318	Well logging	Temperature logging	LA-7	Temperature	1984/11/19	T11
319	Well logging	Temperature logging	LA-7	Temperature	1984/11/23	T12
320	Well logging	Temperature logging	LA-7	Temperature	1984/11/23	T13
321	Well logging	Temperature logging	LA-7	Temperature	1984/11/24	T14
322	Well logging	Temperature logging	LA-7	Temperature	1984/12/3	T15
323	Well logging	Temperature logging	LA-7	Temperature	1984/12/4	T16
324	Well logging	Temperature logging	LA-7	Temperature	1984/12/10	T17A
325	Well logging	Temperature logging	LA-7	Temperature	1984/12/11	T17B
326	Well logging	Temperature logging	LA-7	Temperature	1984/12/12	T18
327	Well logging	Temperature logging	LA-7	Temperature	1984/12/26	T19
328	Well logging	Temperature logging	LA-7	Temperature	1985/1/1	T20
329	Well logging	Temperature logging	LA-7	Temperature	1985/1/23	T21
330	Well logging	Temperature logging	LA-7	Temperature	1985/1/26	T22
331	Well logging	Temperature logging	LA-7	Temperature	1985/4/25	T23
332	Well logging	Temperature logging	LA-7	Temperature	1985/4/27	T24
333	Well logging	Temperature logging	LA-7	Temperature	1985/4/29	T25
334	Well logging	Temperature logging	LA-7	Temperature	1985/5/27	T26
335	Well logging	Temperature logging	LA-7	Temperature	1985/5/30	T27
336	Well logging	Temperature logging	LA-7	Temperature	1985/9/21	T28
337	Well logging	Pressure test	LA-7	Pressure	1984/10/17	P1
338	Well logging	Pressure test	LA-7	Pressure	1984/10/24	P3
339	Well logging	Pressure test	LA-7	Pressure	1984/11/17	P4
340	Well logging	Pressure test	LA-7	Pressure	1984/11/25	P5
341	Well logging	Pressure test	LA-7	Pressure	1984/12/2	P6
342	Well logging	Pressure test	LA-7	Pressure	1984/12/25	P7
343	Well logging	Pressure test	LA-7	Pressure	1984/12/31	P8
344	Well logging	Pressure test	LA-7	Pressure	1985/12/1	P9
345	Well logging	Pressure test	LA-7	Pressure	1985/1/22	P10
346	Well logging	Pressure test	LA-7	Pressure	1985/4/26	P12
347	Well logging	Pressure test	LA-7	Pressure	1985/4/27	P13
348	Well logging	Pressure test	LA-7	Pressure	1985/5/20	P14
349	Well logging	Pressure test	LA-7	Pressure	1987/7/12	P15A
350	Well logging	Pressure test	LA-7	Pressure	1987/8/12	P15B
351	Well logging	Pressure test	LA-7	Pressure	1987/10/12	P15C
352	Well logging	Pressure test	LA-7	Pressure	1988/2/8	P16
353	Well logging	Temperature logging	LA-7	Temperature	2006/5/28	Kuster

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
354	Well logging	Pressure test	LA-7	Pressure	2006/5/28	Kuster
355	Well logging	Pressure test	LA-7	Pressure	1984/10/21	Injection-Falloff
356	Well logging	Temperature logging	LA-7	WPH	1985/7/18	Discharge Test
357	Well logging	Temperature logging	LA-7	Flow Rate	1985/7/18	Discharge Test
358	Well logging	Temperature logging	LA-7	Enthalpy	1985/7/18	Discharge Test
359	Well logging	Temperature logging	LA-8	Temperature	1984/12/16	T1
360	Well logging	Temperature logging	LA-8	Temperature	1985/3/11	T2
361	Well logging	Temperature logging	LA-8	Temperature	1985/3/14	T3
362	Well logging	Temperature logging	LA-8	Temperature	1985/3/15	T4
363	Well logging	Temperature logging	LA-8	Temperature	1985/3/19	T6
364	Well logging	Temperature logging	LA-8	Temperature	1985/3/21	T7
365	Well logging	Temperature logging	LA-8	Temperature	1985/3/25	T8
366	Well logging	Temperature logging	LA-8	Temperature	1985/5/5	T9
367	Well logging	Temperature logging	LA-8	Temperature	1985/5/13	T10
368	Well logging	Temperature logging	LA-8	Temperature	1985/9/9	T11
369	Well logging	WHP	LA-8	WHP	1985/4/2	WHP
370	Well logging	Pressure test	LA-8	Pressure	1984/5/12	P1
371	Well logging	Pressure test	LA-8	Pressure	1985/6/5	P3
372	Well logging	Pressure test	LA-8	Pressure	1986/3/28	P4
373	Well logging	Pressure test	LA-8	Pressure	1986/4/25	P5
374	Well logging	Pressure test	LA-8	Pressure	1987/12/15	P6
375	Well logging	Pressure test	LA-8	Pressure	1987/12/22	P7
376	Well logging	Pressure test	LA-8	Pressure	1988/7/23	P8
377	Well logging	Temperature logging	LA-8	Temperature	2006/5/28	Kuster
378	Well logging	Pressure test	LA-8	Pressure	2006/5/28	Kuster
379	Well logging	Pressure test	LA-8	Pressure	1985/3/13	Injection-Falloff
380	Well logging	Temperature logging	LA-8	WPH	1985/5/18	Discharge Test
381	Well logging	Temperature logging	LA-8	Flow Rate	1985/5/18	Discharge Test
382	Well logging	Temperature logging	LA-8	Enthalpy	1985/5/18	Discharge Test
385	Well logging	Temperature logging	LA-1	Temperature	1982/10/29	
386	Well logging	Temperature logging	TG-10	Temperature	1982/2/10	
387	Well logging	Temperature logging	TG-11	Temperature	1982/10/31	
388	Well logging	Temperature logging	TG-11	Temperature	1982/10/24	T1
389	Well logging	Temperature logging	TG-11	Temperature	1982/10/25	T2
390	Well logging	Temperature logging	TG-11	Temperature	1982/10/26	T3
391	Well logging	Temperature logging	TG-11	Temperature	1982/10/27	T4
392	Well logging	Temperature logging	TG-11	Temperature	1982/10/28	T5
393	Well logging	Temperature logging	TG-11	Temperature	1982/10/31	T6
394	Well logging	Temperature logging	TG-11	Temperature	1982/11/6	T7
395	Well logging	Temperature logging	TG-12	Temperature	1982/10/29	T1
396	Well logging	Temperature logging	TG-12	Temperature	1982/10/30	T2
397	Well logging	Temperature logging	TG-12	Temperature	1982/11/11	T3
398	Well logging	Temperature logging	TG-12	Temperature	1982/11/4	T4
399	Well logging	Temperature logging	TG-12	Temperature	1982/4/11	
400	Well logging	Temperature logging	TG-12A	Temperature	1982/10/29	T1A
401	Well logging	Temperature logging	TG-12A	Temperature	1982/10/30	T2A
402	Well logging	Temperature logging	TG-12A	Temperature	1982/11/1	T3A
403	Well logging	Temperature logging	TG-12A	Temperature	1982/11/4	T4A
404	Well logging	Temperature logging	TG-13	Temperature	1982/10/30	T1
405	Well logging	Temperature logging	TG-13	Temperature	1982/11/1	T2
406	Well logging	Temperature logging	TG-13	Temperature	1982/11/15	T3
407	Well logging	Temperature logging	TG-13	Temperature	1982/11/10	T4
408	Well logging	Temperature logging	TG-13	Temperature	1982/10/11	
409	Well logging	Temperature logging	TG-13A	Temperature	1982/11/1	T2A
410	Well logging	Temperature logging	TG-13A	Temperature	1982/11/5	T3A
411	Well logging	Temperature logging	TG-13A	Temperature	1982/11/10	T4A
412	Well logging	Temperature logging	TG-13A	Temperature	1982/10/30	T1A
413	Well logging	Temperature logging	TG-14	Temperature	1982/11/16	
414	Well logging	Temperature logging	TG-15	Temperature	1982/7/11	



S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
415	Well logging	Temperature logging	TG-16	Temperature	1982/9/11	
416	Well logging	Temperature logging	TG-17	Temperature	1982/10/11	
417	Well logging	Temperature logging	TG-18	Temperature	1982/12/11	
418	Well logging	Temperature logging	TG-19	Temperature	1982/11/4	
419	Well logging	Temperature logging	TG-2	Temperature	1982/10/28	
420	Well logging	Temperature logging	TG-20	Temperature	1982/11/15	
421	Well logging	Temperature logging	TG-21	Temperature	1982/11/16	
422	Well logging	Temperature logging	TG-22	Temperature	1982/11/17	
423	Well logging	Temperature logging	TG-23	Temperature	1982/11/17	
424	Well logging	Temperature logging	TG-24	Temperature	1982/11/18	
425	Well logging	Temperature logging	TG-25	Temperature	1982/11/18	
426	Well logging	Temperature logging	TG-3	Temperature	1982/11/25	
427	Well logging	Temperature logging	TG-4	Temperature	1982/6/2	
428	Well logging	Temperature logging	TG-5	Temperature	1982/6/8	
429	Well logging	Temperature logging	TG-6	Temperature	1982/12/2	
430	Well logging	Temperature logging	TG-7	Temperature	1982/5/25	
431	Well logging	Temperature logging	TG-8	Temperature	1982/11/11	
432	Well logging	Temperature logging	TG-11	Temperature	1982/10/29	
433	Well logging	Temperature logging	TG-12	Temperature	1982/2/10	
434	Well logging	Temperature logging	TG-13	Temperature	1982/10/31	
435	Well logging	Temperature logging	TG-14	Temperature	1982/10/24	
436	Well logging	Temperature logging	TG-15	Temperature	1982/10/25	
437	Well logging	Temperature logging	TG-16	Temperature	1982/10/26	
438	Well logging	Temperature logging	TG-17	Temperature	1982/10/27	
439	Well logging	Temperature logging	TG-18	Temperature	1982/10/28	
440	Well logging	Temperature logging	TG-19	Temperature	1982/10/31	
441	Well logging	Temperature logging	TG-20	Temperature	1982/11/6	
442	Well logging	Temperature logging	TG-21	Temperature	1982/10/29	
443	Well logging	Temperature logging	TG-22	Temperature	1982/10/30	
444	Well logging	Temperature logging	TG-23	Temperature	1982/11/11	
445	Well logging	Temperature logging	TG-24	Temperature	1982/11/4	
446	Well logging	Temperature logging	TG-25	Temperature	1982/4/11	
447	Well logging	Temperature logging	TG-11	Temperature	1982/10/29	T1
448	Well logging	Temperature logging	TG-11	Temperature	1982/10/30	T2
449	Well logging	Temperature logging	TG-11	Temperature	1982/11/1	T3
450	Well logging	Temperature logging	TG-11	Temperature	1982/11/4	T4
451	Well logging	Temperature logging	TG-11	Temperature	1982/10/30	T5
452	Well logging	Temperature logging	TG-11	Temperature	1982/11/1	T6
453	Well logging	Temperature logging	TG-11	Temperature	1982/11/15	T7
454	Well logging	Temperature logging	TG 2	Temperature	1982/11/10	
455	Well logging	Temperature logging	TG 3	Temperature	1982/10/11	
456	Well logging	Temperature logging	LA-1	Temperature	1982/11/1	
457	Well logging	Temperature logging	TG 4	Temperature	1982/11/5	
458	Well logging	Temperature logging	TG 5	Temperature	1982/11/10	
459	Well logging	Temperature logging	TG 6	Temperature	1982/10/30	
460	Well logging	Temperature logging	TG 7	Temperature	1982/11/16	
461	Well logging	Temperature logging	TG 8	Temperature	1982/7/11	
462	Well logging	Temperature logging	TG 10	Temperature	1982/9/11	
463	Well logging	Temperature logging	TG 12	Temperature	1982/10/11	T1
464	Well logging	Temperature logging	TG 12	Temperature	1982/12/11	T2
465	Well logging	Temperature logging	TG 12	Temperature	1982/11/4	T3
466	Well logging	Temperature logging	TG 12	Temperature	1982/10/28	T4
467	Well logging	Temperature logging	TG 12A	Temperature	1982/11/15	T1A
468	Well logging	Temperature logging	TG 12A	Temperature	1982/11/16	T2A
469	Well logging	Temperature logging	TG 12A	Temperature	1982/11/17	T3A
470	Well logging	Temperature logging	TG 12A	Temperature	1982/11/17	T4A
471	Well logging	Temperature logging	TG 13	Temperature	1982/11/18	T1
472	Well logging	Temperature logging	TG 13	Temperature	1982/11/18	T2
473	Well logging	Temperature logging	TG 13	Temperature	1982/11/25	T3



S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
474	Well logging	Temperature logging	TG 13	Temperature	1982/6/2	T4
475	Well logging	Temperature logging	TG 13A	Temperature	1982/6/8	T1A
476	Well logging	Temperature logging	TG 13A	Temperature	1982/12/2	T2A
477	Well logging	Temperature logging	TG 13A	Temperature	1982/5/25	T3A
478	Well logging	Temperature logging	TG 13A	Temperature	1982/11/11	T4A

## Well Logging Data in Tendaho area

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
1	Well logging	WHP	TD-1	Pressure	2002/2/19	
2	Well logging	Pressure test	TD-1	Pressure	1993/11/5	N.1
3	Well logging	Temperature logging	TD-1	Temperature	1993/11/5	N.1
4	Well logging	Temperature logging	TD-1	Temperature	1993/11/13	N.2
5	Well logging	Pressure test	TD-1	Pressure	1993/11/14	N.2
6	Well logging	Temperature logging	TD-1	Temperature	1993/11/14	N.3
7	Well logging	Pressure test	TD-1	Pressure	1993/11/16	N.3
8	Well logging	Temperature logging	TD-1	Temperature	1993/11/16	N.4
9	Well logging	Temperature logging	TD-1	Temperature	1993/11/17	N.5
10	Well logging	Pressure test	TD-1	Pressure	1993/11/23	N.4
11	Well logging	Temperature logging	TD-1	Temperature	1993/11/23	N.6
12	Well logging	Pressure test	TD-1	Pressure	1993/12/4	N.5
13	Well logging	Temperature logging	TD-1	Temperature	1993/12/4	N.7
14	Well logging	Pressure test	TD-1	Pressure	1993/12/9	N.6
15	Well logging	Temperature logging	TD-1	Temperature	1993/12/9	N.8
16	Well logging	Temperature logging	TD-1	Temperature	1993/12/9	N.9
17	Well logging	Pressure test	TD-1	Pressure	1993/12/18	N.7
18	Well logging	Temperature logging	TD-1	Temperature	1993/12/18	N.10
19	Well logging	Pressure test	TD-1	Pressure	1993/12/20	N.8
20	Well logging	Temperature logging	TD-1	Temperature	1993/12/20	N.11
21	Well logging	Pressure test	TD-1	Pressure	1993/12/25	N.9
22	Well logging	Pressure test	TD-1	Pressure	1993/12/28	N.10
23	Well logging	Pressure test	TD-1	Pressure	1994/1/1	N.11
24	Well logging	Temperature logging	TD-1	Temperature	1994/1/2	N.12
25	Well logging	Pressure test	TD-1	Pressure	1994/2/24	N.12
26	Well logging	Temperature logging	TD-1	Temperature	1994/1/10	N.13
27	Well logging	Pressure test	TD-1	Pressure	1994/2/27	N.13
28	Well logging	Temperature logging	TD-1	Temperature	1994/2/27	N.14
29	Well logging	Temperature logging	TD-1	Temperature	2007/4/4	
30	Well logging	Injection test	TD-1	Injection Rate	1993/11/16	N.1
31	Well logging	Injection test	TD-1	Pressure	1993/11/16	N.1
32	Well logging	Injection test	TD-1	Injection Rate	1993/12/11	N.2
33	Well logging	Injection test	TD-1	Injection Rate	1993/12/11	N.2
34	Well logging	Fall-off test	TD-1	Pressure	1950/1/1	
35	Well logging	Fall-off test	TD-1	delta P	1950/1/1	
36	Well logging	Fall-off test	TD-1	Pressure	1994/10/20	N.1
37	Well logging	Fall-off test	TD-1	delta P	1994/10/20	N.1
38	Well logging	Temperature logging	TD-1	Temperature	1993/11/6	N.1
39	Well logging	Temperature logging	TD-1	Temperature	1993/11/14	N.2
40	Well logging	Temperature logging	TD-1	Temperature	1993/11/23	N.3
41	Well logging	Temperature logging	TD-1	Temperature	1993/12/10	N.4
42	Well logging	WHP	TD-2	Pressure	2002/2/19	
43	Well logging	Pressure test	TD-2	Pressure	1994/5/25	N.1
44	Well logging	Temperature logging	TD-2	Temperature	1994/5/25	N.1
45	Well logging	Pressure test	TD-2	Pressure	1994/4/3	N.2
46	Well logging	Temperature logging	TD-2	Temperature	1994/4/3	N.2
47	Well logging	Pressure test	TD-2	Pressure	1994/4/18	N.3
48	Well logging	Temperature logging	TD-2	Temperature	1994/4/18	N.3
49	Well logging	Pressure test	TD-2	Pressure	1994/4/21	N.4
50	Well logging	Temperature logging	TD-2	Temperature	1994/4/24	N.6
51	Well logging	Temperature logging	TD-2	Temperature	1994/4/30	N.7
52	Well logging	Pressure test	TD-2	Pressure	1994/5/5	N.7
53	Well logging	Temperature logging	TD-2	Temperature	1994/5/5	N.8
54	Well logging	Pressure test	TD-2	Pressure	1994/5/19	N.8
55	Well logging	Temperature logging	TD-2	Temperature	1994/5/19	N.9
56	Well logging	Pressure test	TD-2	Pressure	1994/5/24	N.9
57	Well logging	Temperature logging	TD-2	Temperature	1994/5/24	N.1
58	Well logging	Temperature logging	TD-2	Temperature	1994/5/25	N.11

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
59	Well logging	Pressure test	TD-2	Pressure	1994/5/30	N.10
60	Well logging	Pressure test	TD-2	Pressure	1994/6/2	N.11
61	Well logging	Temperature logging	TD-2	Temperature	1994/6/2	N.13
62	Well logging	Pressure test	TD-2	Pressure	1994/9/25	N.12
63	Well logging	Temperature logging	TD-2	Temperature	1994/9/25	N.13
64	Well logging	Temperature logging	TD-2	Temperature	2005/4/19	
65	Well logging	Temperature logging	TD-2	Temperature	2007/3/24	
66	Well logging	Pressure test	TD-2	Pressure	2007/3/23	
67	Well logging	Discharge Test	TD-2	WHP	1994/5/16	
68	Well logging	Discharge Test	TD-2	WHT	1994/5/16	
69	Well logging	Discharge Test	TD-2	P lip	1994/5/16	
70	Well logging	Discharge Test	TD-2	hw	1994/5/16	
71	Well logging	Discharge Test	TD-2	WT	1994/5/16	
72	Well logging	Pressure test	TD-2	Pressure	1994/5/19	N.1
73	Well logging	Pressure test	TD-2	delta P	1994/5/19	N.1
74	Well logging	Temperature logging	TD-2	Temperature	1994/5/25	N.1
75	Well logging	Temperature logging	TD-2	Temperature	1994/4/7	N.2
76	Well logging	Pressure test	TD-2	Pressure	1994/5/26	N.2
77	Well logging	Pressure test	TD-2	delta P	1994/5/26	N.2
78	Well logging	Pressure test	TD-2	Pressure	1994/6/4	N.3
79	Well logging	Pressure test	TD-2	delta P	1994/6/4	N.3
80	Well logging	Pressure test	TD-2	Pressure	1994/6/11	N.4
81	Well logging	Pressure test	TD-2	delta P	1994/6/11	N.4
82	Well logging	Pressure test	TD-2	Pressure	1994/6/17	N.5
83	Well logging	Pressure test	TD-2	delta P	1994/6/17	N.5
84	Well logging	Pressure test	TD-2	Pressure	1994/6/30	N.5
85	Well logging	Pressure test	TD-2	delta P	1994/6/30	N.5
86	Well logging	Temperature logging	TD-3	Temperature	1994/9/13	N.1
87	Well logging	Temperature logging	TD-3	Temperature	1994/9/13	N.2
88	Well logging	Temperature logging	TD-3	Temperature	1994/9/15	N.3
89	Well logging	Pressure test	TD-3	Pressure	1994/9/21	N.2
90	Well logging	Temperature logging	TD-3	Temperature	1994/9/21	N.4
91	Well logging	Pressure test	TD-3	Pressure	1994/9/26	N.3
92	Well logging	Temperature logging	TD-3	Temperature	1994/9/26	N.5
93	Well logging	Pressure test	TD-3	Pressure	1994/9/30	N.5
94	Well logging	Temperature logging	TD-3	Temperature	1994/9/30	N.6
95	Well logging	Pressure test	TD-3	Pressure	1994/10/7	N.6
96	Well logging	Temperature logging	TD-3	Temperature	1994/10/7	N.7
97	Well logging	Pressure test	TD-3	Pressure	1994/10/10	N.7
98	Well logging	Temperature logging	TD-3	Temperature	1994/10/10	N.8
99	Well logging	Pressure test	TD-3	Pressure	1994/10/14	N.8
100	Well logging	Temperature logging	TD-3	Temperature	1994/10/14	N.9
101	Well logging	Pressure test	TD-3	Pressure	1994/10/15	
102	Well logging	Temperature logging	TD-3	Temperature	1994/10/15	N.10
103	Well logging	Pressure test	TD-3	Pressure	1994/10/20	N.9
104	Well logging	Temperature logging	TD-3	Temperature	1994/10/20	N.11
105	Well logging	Temperature logging	TD-3	Temperature	1994/10/21	N.12
106	Well logging	Pressure test	TD-3	Pressure	1994/10/25	N.10
107	Well logging	Temperature logging	TD-3	Temperature	1994/10/25	N.13
108	Well logging	Pressure test	TD-3	Pressure	1994/10/30	N.11
109	Well logging	Temperature logging	TD-3	Temperature	1994/10/30	N.14
110	Well logging	Temperature logging	TD-3	Temperature	1994/11/1	N.15
111	Well logging	Temperature logging	TD-3	Temperature	1994/10/10	N.6
112	Well logging	Injection test	TD-3	Injection Rate	1994/10/20	N.1
113	Well logging	Injection test	TD-3	Pressure	1994/10/20	N.1
114	Well logging	Temperature logging	TD-3	Temperature	1994/9/21	N.1
115	Well logging	Temperature logging	TD-3	Temperature	1994/9/26	N.2
116	Well logging	Temperature logging	TD-3	Temperature	1994/9/30	N.3
117	Well logging	Temperature logging	TD-3	Temperature	1994/10/10	N.4

S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
118	Well logging	Temperature logging	TD-3	Temperature	1994/10/14	
119	Well logging	Temperature logging	TD-3	Temperature	1994/10/10	N.5
120	Well logging	WHP	TD-4	Pressure	2002/2/19	
121	Well logging	Pressure test	TD-4	Pressure	1994/5/3	N.1
122	Well logging	Temperature logging	TD-4	Temperature	1994/5/3	N.1
123	Well logging	Pressure test	TD-4	Pressure	1994/5/8	N.2
124	Well logging	Temperature logging	TD-4	Temperature	1994/5/8	N.2
125	Well logging	Temperature logging	TD-4	Temperature	1994/5/8	N.3
126	Well logging	Pressure test	TD-4	Pressure	1994/5/14	N.3
127	Well logging	Temperature logging	TD-4	Temperature	1994/5/14	N.4
128	Well logging	Pressure test	TD-4	Pressure	1994/5/18	N.4
129	Well logging	Temperature logging	TD-4	Temperature	1994/5/18	N.5
130	Well logging	Pressure test	TD-4	Pressure	1994/5/19	N.5
131	Well logging	Temperature logging	TD-4	Temperature	1994/5/19	N.6
132	Well logging	Pressure test	TD-4	Pressure	1995/5/27	N.6
133	Well logging	Temperature logging	TD-4	Temperature	1995/5/27	N.7
134	Well logging	Pressure test	TD-4	Pressure	1995/6/4	N.7
135	Well logging	Temperature logging	TD-4	Temperature	1995/6/4	N.8
136	Well logging	Pressure test	TD-4	Pressure	2005/3/1	N.11
137	Well logging	Temperature logging	TD-4	Temperature	2005/3/3	N.15
138	Well logging	Temperature logging	TD-4	Temperature	2005/3/20	N.14
139	Well logging	Pressure test	TD-4	Pressure	2006/1/31	N.12
140	Well logging	Pressure test	TD-4	Pressure	2006/2/1	N.13
141	Well logging	Temperature logging	TD-4	Temperature	2006/1/31	N.16
142	Well logging	Temperature logging	TD-4	Temperature	2007/3/20	N.17
143	Well logging	Pressure test	TD-4	Pressure	2007/3/19	N.14
144	Well logging	Pressure test	TD-4	Pressure	1995/5/18	
145	Well logging	Pressure test	TD-4	Pressure	1995/5/20	N.1
146	Well logging	Pressure test	TD-4	Pressure	1995/5/27	N.1
147	Well logging	Temperature logging	TD-4	Temperature	1995/5/18	
148	Well logging	Temperature logging	TD-4	Temperature	1995/5/20	
149	Well logging	Fall-off test	TD-4	Pressure	1995/5/12	N.1
150	Well logging	Fall-off test	TD-4	delta P	1995/5/12	N.1
151	Fall-off test	Discharge Test	TD-4	WHP	1995/5/14	
152	Fall-off test	Discharge Test	TD-4	WHT	1995/5/14	
153	Fall-off test	Discharge Test	TD-4	P lip	1995/5/14	
154	Fall-off test	Discharge Test	TD-4	hw	1995/5/14	
155	Fall-off test	Discharge Test	TD-4	WT	1995/5/14	
156	Well logging	Pressure test	TD-5	WHP	1995/5/14	
157	Well logging	WHP	TD-5	Pressure	2002/2/19	
158	Well logging	Temperature logging	TD-5	Temperature	2002/3/21	N.14
159	Well logging	Temperature logging	TD-5	Temperature	2002/3/22	N.15
160	Well logging	Temperature logging	TD-5	Temperature	2002/3/23	N.15
161	Well logging	Pressure test	TD-5	Pressure	2002/3/20	N.13
162	Well logging	Temperature logging	TD-5	Temperature	2002/3/19	N.16
163	Well logging	Pressure test	TD-5	Pressure	2002/3/19	N.14
164	Well logging	Pressure test	TD-5	Pressure	2002/3/22	N.15
165	Well logging	Temperature logging	TD-5	Temperature	2002/3/28	N.12
166	Well logging	Temperature logging	TD-5	Temperature	2002/4/22	N.18
167	Well logging	Temperature logging	TD-5	Temperature	2002/4/23	N.19
168	Well logging	Temperature logging	TD-5	Temperature	2002/4/5	N.20
169	Well logging	Pressure test	TD-5	Pressure	2002/4/5	N.16
170	Well logging	Pressure test	TD-5	Pressure	2004/4/21	
171	Well logging	Pressure test	TD-5	Pressure	2004/5/4	
172	Well logging	Pressure test	TD-5	Pressure	2004/5/12	
173	Well logging	Pressure test	TD-5	Pressure	2004/5/14	
174	Well logging	Pressure test	TD-5	Pressure	2005/3/7	
175	Well logging	Pressure test	TD-5	Pressure	2005/3/8	
176	Well logging	Pressure test	TD-5	Pressure	2005/3/9	



S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
177	Well logging	Pressure test	TD-5	Pressure	2005/3/29	
178	Well logging	Pressure test	TD-5	Pressure	2005/3/9	
179	Well logging	Temperature logging	TD-5	Temperature	2005/3/8	
180	Well logging	Temperature logging	TD-5	Temperature	2005/3/29	
181	Well logging	Temperature logging	TD-5	Temperature	2005/4/11	
182	Well logging	Pressure test	TD-5	Pressure	2006/2/9	
183	Well logging	Pressure test	TD-5	Pressure	2006/3/6	
184	Well logging	Pressure test	TD-5	Pressure	2006/3/8	
185	Well logging	Pressure test	TD-5	Pressure	2006/3/8	
186	Well logging	Pressure test	TD-5	Pressure	2006/3/27	
187	Well logging	Temperature logging	TD-5	Temperature	2006/2/10	
188	Well logging	Temperature logging	TD-5	Temperature	2006/3/7	
189	Well logging	Temperature logging	TD-5	Temperature	2006/3/28	
190	Well logging	Pressure test	TD-5	Pressure	2007/4/2	
191	Well logging	Temperature logging	TD-5	Temperature	2007/4/2	
192	Well logging	production test	TD-5	Pwh	2003/3/25	
193	Well logging	production test	TD-5	Twh	2003/3/25	
194	Well logging	production test	TD-5	P lip	2003/3/25	
195	Well logging	production test	TD-5	Weir h.	2003/3/25	
196	Well logging	production test	TD-5	Mw	2003/3/25	
197	Well logging	production test	TD-5	Ms	2003/3/25	
198	Well logging	production test	TD-5	Mt	2003/3/25	
199	Well logging	production test	TD-5	H	2003/3/25	
200	Well logging	production test	TD-5	Qth	2003/3/25	
201	Well logging	Discharge Test	TD-5	Pwh	2003/3/25	
202	Well logging	Discharge Test	TD-5	P lip	2003/3/25	
203	Well logging	Discharge Test	TD-5	Weir h.	2003/3/25	
204	Well logging	WHP	TD-6	Pressure	2002/2/20	
205	Well logging	Temperature logging	TD-6	Temperature	2002/3/29	T10
206	Well logging	Temperature logging	TD-6	Temperature	2002/4/1	T11
207	Well logging	Pressure test	TD-6	Pressure	2002/3/27	P16
208	Well logging	Pressure test	TD-6	Pressure	2002/3/28	P16
209	Well logging	Pressure test	TD-6	Pressure	2002/3/30	P17
210	Well logging	Temperature logging	TD-6	Temperature	2003/3/28	T12
211	Well logging	Pressure test	TD-6	Pressure	2003/3/27	P18
212	Well logging	Pressure test	TD-6	Pressure	2003/3/29	P19
213	Well logging	Temperature logging	TD-6	Temperature	2004/3/30	T13
214	Well logging	Temperature logging	TD-6	Temperature	2004/4/1	T15
215	Well logging	Pressure test	TD-6	Pressure	2004/3/29	P20
216	Well logging	Pressure test	TD-6	Pressure	2004/4/3	P21
217	Well logging	Temperature logging	TD-6	Temperature	2005/2/24	N.16
218	Well logging	Pressure test	TD-6	Pressure	2005/2/26	P24
219	Well logging	Pressure test	TD-6	Pressure	2005/2/25	P23
220	Well logging	Pressure test	TD-6	Pressure	2005/2/24	P22
221	Well logging	Pressure test	TD-6	Pressure	2006/2/6	P25
222	Well logging	Pressure test	TD-6	Pressure	2006/2/7	P26
223	Well logging	Temperature logging	TD-6	Temperature	2006/2/2	N.17
224	Well logging	Temperature logging	TD-6	Temperature	2006/2/4	N.18
225	Well logging	Temperature logging	TD-6	Temperature	2007/3/27	N.18
226	Well logging	Pressure test	TD-6	Pressure	2007/3/28	P27
227	Well logging	Temperature logging	GBH-1	Temperature	1980/2/28	T4
228	Well logging	Temperature logging	GBH-2	Temperature	1980/4/29	T3
229	Well logging	Temperature logging	GBH-2	Temperature	1994/10/7	T4
230	Well logging	Temperature logging	GBH-3	Temperature	1980/4/29	T2
231	Well logging	Temperature logging	GBH-4	Temperature	1980/5/2	T1
232	Well logging	Temperature logging	GBH-5	Temperature	1980/5/1	T3
233	Well logging	Temperature logging	GBH-6	Temperature	1980/4/24	T4
234	Well logging	Temperature logging	GBH-6	Temperature	1994/7/7	T5
235	Well logging	Temperature logging	GBH-6	Temperature	1994/10/6	T6



S/N	Classification	Test Type	Location /Well ID	Measurement	Observation date	Remarks
236	Well logging	Temperature logging	GBH-7	Temperature	1980/4/26	T2
237	Well logging	Temperature logging	GBH-8	Temperature	1980/4/28	T1
238	Well logging	Temperature logging	GBH-8	Temperature	1994/10/8	T2
239	Well logging	Temperature logging	GBH-9	Temperature	1994/5/21	T1
240	Well logging	Temperature logging	GBH-9	Temperature	1994/5/25	T2
241	Well logging	Temperature logging	GBH-9	Temperature	1994/6/20	T3
242	Well logging	Temperature logging	GBH-9	Temperature	1994/5/24	T4
243	Well logging	Temperature logging	GBH-9	Temperature	1994/7/23	T5
244	Well logging	Temperature logging	GBH-9	Temperature	1994/10/13	T6
245	Well logging	Temperature logging	GBH-9	Temperature	1995/5/9	T7
246	Well logging	Temperature logging	GBH-9	Temperature	1995/5/23	T8