Supporting Information for "Torfajökull's magmatic plumbing system with seismic interferometry and phase-velocity surface-wave tomography"

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Additional Supporting Information (Files uploaded separately)

1. Comma-separated file ($Torfamodelresults.txt$) with the 3D S-wave velocity, velocity anomalies and corresponding standard deviation of the best 10% models at each grid cell (results displayed in Figure 13, 14 and 15 of the manuscript).

Introduction

The supporting information described in this document contains details on the seismic network in Table S1 (e.g. station location, data recovery). The files uploaded separately

contain the results of the tomographic 3D model (depicted in Figures 13, 14 and 15a-d of the main manuscript).

Data Set 1: Model results (Figure 13, 14 and 15) The uploaded separately comma-separated values file contains the 3-D shear velocity model, anomalies and corresponding uncertainties. Each line of the file corresponds to a single grid-cell and NaN values indicate grid point without information. For each depth value there is a matrix of 50 by 50 grid cells. The file with name $Torfamodelresults.txt$ contains the following information:

- lon [deg] - Longitude in degrees.
- lat[deg] - Latitude in degrees.
- depth [m] - Depth in meters .
- SwaveVel [m/s] - S-wave velocity in meters per seconds.
- RefVel [m/s] - Reference velocity per layer in meters per seconds.
- Anomalies [%] - S-wave velocity anomalies w.r.t. an average 1-D velocity model at depth, percentage.
- stdev [m/s] - S-wave velocity standard deviation of the 1000 models with lowest misfit.

The uploaded comma-separated values file can be read e.g. with the following Matlab function:

```
function readTorfaMod(depth)
% This function plots the model results (Figure 13, 14 and 15) as
publiced
% in Martins et al. (2019). The underlying model data is in the file
% Torfa_mod_results.txt. Make sure that this file is in the same
directory
% as this function.
%
% USAGE:    readTorfaMod(depth)
%
% INPUT:
% depth:    any depth [m] as ploted in the manuscript from 1500m to
6000m
%
% EXAMPLE:
% readTorfaMod(2000)

%% open file

filename='Torfa_model_results.txt';
fid=fopen(filename,'r');
C=textscan(fid,'%f%f%f%f%f%f%f', 'delimiter',',', 'Headerlines',1);
fclose(fid);
lon=C{1};
lat=C{2};
dep=C{3};
Vs=C{4};
RefV=C{5};
dVs=C{6};
stdVs=C{7};

%% Reshape
ind=find(dep==depth);

lon=lon(ind);
lat=lat(ind);
dVs=dVs(ind);
Vs=Vs(ind);
stdVs=stdVs(ind);

lon=reshape(lon,[50,50]);
lat=reshape(lat,[50,50]);
dVs=reshape(dVs,[50,50]);
Vs=reshape(Vs,[50,50]);
stdVs=reshape(stdVs,[50,50]);

%% Plots

figure('color','w');
subplot(1,3,1)
pcolor(lon,lat,dVs);
title(['Anomalies[%] at ',num2str(depth), ' m depth'],'FontSize',14)
xlabel('Longitude','FontSize',14)
ylabel('Latitude','FontSize',14)
colormap(flipud(jet))
colorbar
```

```
subplot(1,3,2)
pcolor(lon,lat,stdVs);
title(['stdev[m/s] at ',num2str(depth), ' m depth'],'FontSize',14)
xlabel('Longitude','FontSize',14)
ylabel('Latitude','FontSize',14)
colorbar

subplot(1,3,3)
pcolor(lon,lat,Vs);
title(['SwaveVel[m/s] at ',num2str(depth), ' m depth'],'FontSize',14)
xlabel('Longitude','FontSize',14)
ylabel('Latitude','FontSize',14)
colormap(flipud(jet))
colorbar

end
```

Table S1. The volume of data gathered during the seismic campaign, summer 2005, described in the main manuscript.

Station	Lat [°N]	Lon [°N]	Elevation [m]	Installed	Pick-up	Operation [days]	Recovery [days]
LAUF	63.90916	19.43146	658	09/Jun	05/Oct	117.95	117.95
BIKS	63.94943	19.41237	779	09/Jun	05/Oct	117.9	117.9
RAFF	63.96364	19.43877	911	09/Jun	05/Oct	117.86	117.86
KRAK	64.03248	19.37757	682	10/Jun	05/Oct	117.06	117.06
SATU	63.01809	19.28747	671	10/Jun	04/Oct	116.18	116.18
DOMA	64.03158	19.09841	652	10/Jun	04/Oct	116.18	116.18
BRAN	63.97903	19.04707	620	10/Jun	04/Oct	116.07	116.07
POKA	63.98442	19.26821	917	11/Jun	05/Oct	116.09	116.09
HRAF	63.95618	19.21494	897	11/Jun	05/Oct	116.08	109.08
REYD	63.97201	19.26449	917	11/Jun	05/Oct	116.03	116.03
VEST	63.95115	19.31254	872	11/Jun	05/Oct	115.74	115.74
SODU	63.93718	19.17151	1078	14/Jun	19/Oct	127.09	127.09
HRAS	63.93641	19.20482	1018	14/Jun	05/Oct	113.03	113.03
JOKU	63.92701	19.18447	1109	14/Jun	19/Oct	126.95	126.95
TORF	63.86405	19.24982	547	15/Jun	07/Oct	113.96	113.96
LJOS	63.8933	19.24454	697	15/Jun	07/Oct	113.86	113.86
MAEL	63.8164	19.01667	619	15/Jun	06/Oct	113.09	88.44
KGIL	63.85869	18.97325	603	15/Jun	06/Oct	112.98	112.98
STRU	63.84095	18.97253	576	15/Jun	06/Oct	112.91	107.31
THRA	63.82057	19.19711	580	16/Jun	06/Oct	112.32	112.32
SVAR	63.83705	19.06336	605	16/Jun	07/Oct	112.98	112.98
KKLO	63.87033	19.05419	655	16/Jun	07/Oct	112.93	112.93
MAFE	63.8117	18.90571	552	16/Jun	06/Oct	111.97	111.97
HALL	63.97064	18.83239	601	20/Jun	06/Oct	107.78	107.78
KIRK	63.97617	18.90944	605	20/Jun	06/Oct	107.7	105.2
TIND	63.95618	18.74455	682	21/Jun	06/Oct	107.06	107.06
THOR	63.88849	18.69845	490	21/Jun	06/Oct	107.03	107.03
SHNU	63.8414	18.75374	591	21/Jun	06/Oct	107	107
HAUH	63.89973	19.09278	963	22/Jun	20/Oct	120.1	120.1
HEIT	63.90829	19.03936	971	22/Jun	20/Oct	120.05	120.05