

POS338 Seismic Line 11 – File Description

Here we provide seismic line 11 from POS338 data-set collected 2006 under the supervision of Chief Scientist Prof. Dr. Christian Hübscher, University of Hamburg. This seismic line crosses the Santorini-Anafi basin as well as the Amorgos basin NE of Santorini and is part of a wide collection of reflection seismic profiles acquired onboard R/V Poseidon, operated by GEOMAR Helmholtz Centre for Ocean Research Kiel. This survey was funded by the German Research Foundation (Deutsche Forschungsgesellschaft, DFG) and had the aim to image the Santorini-Amorgos Tectonic Zone which is well known for its catastrophic volcanic eruptions, earthquakes, and tsunamis. A single G.I. Gun has been used for this survey in true G.I. Mode (Injector volume: 45 in³, Generator volume: 105 in³) as seismic source, producing a signal of 100 Hz main frequency. The data were recorded with a 24 channel streamer of 600 m length (25 m channel spacing) and were recorded in SEG-Y format.

Seismic line 11 is used in Preine et al. (in review). These authors utilize the faint diffracted wavefield contained in the data to calculate a depth-velocity model for Pre-stack depth migration. Their method works by first modelling the reflected wavefield and then subtracting it from the input-data in the zero-offset domain. The resulting Diffraction-Only section is used to (i) focus the diffractions and derive so-called diffraction-images and to (ii) calculate wavefront attributes and to perform wavefront tomography in order to arrive at a depth-velocity model. This model is manually refined by examining diffraction focussing and then used for post-stack FD migration.

These SEG-Y data files allow the reconstruction of each step described in Preine et al. (in review).

File name	File Description
P11_01-Raw-Prestack.sgy:	Raw pre-stack data
P11_02-CMP-Stack.sgy:	CMP stack generated with a CMP spacing of 12.5 m, after simple bandpass-filtering, top- and trace-muting as well as the application of surface-related multiple elimination (SRME). This stack is used as Input for the diffraction-separation
P11_03-Reflection-Only.sgy:	Modelled Reflections
P11_04-Diffraction-Only.sgy:	Separated Diffractions derived by adaptively subtracting the modelled reflections from the CMP-stack
P11_05-Focussed-Diffractions.sgy:	Diffraction Image gained through Kichhoff-Type focusing
P11_06-Diffraction-Coherency.sgy:	Semblance section of the Diffraction-Only data used to calculate wavefront attributes
P11_07-Inverted-Velocity-Model.sgy:	Depth-velocity model gained by wavefront tomography using the wavefront attributes calculated from the diffraction-coherency
P11_08-Refined-Velocity-Model.sgy:	Manually refined depth velocity model
P11_09-Post-Stack-Depth-Migration.sgy:	Post-stack Depth migration using the velocity model provided in "P11_08-Refined-Velocity-Model.sgy" after application of a Top-Mute and White-Noise Removal
P11_10-Focussed-Diffractions_Depth-Domain.sgy:	Post-stack Depth migration of the separated Diffractions using the velocity model provided in "P11_08-Refined-Velocity-Model.sgy" after calculation of the envelope