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(CSA-2; Arava Valley, Jordan, Oct./Nov. 2001)

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Abstract
SEG-Y data of small-scale high-resolution controlled-source seismic experiment to investigate the mesoscopic fault structure of the Wadi Arava fault, Dead Sea Transform.

1. Introduction

The Dead Sea Transform (DST) is a major shear zone running for more than 1000km from the Red Sea in the South to the Zagros mountain chain in the North. It accommodates the lateral movement of the Sinai microplate and the Arabian shield; the total displacement along this shear zone is >100km. As part of the DESERT 2000 research project, several geophysical studies on a wide range of scales aimed to reveal the structure and evolution of the DST (Weber et al., 2009, 2010, and references therein). In October/November 2010 we conducted a high-resolution seismic experiment in the central part of the Arava/Araba segment of the shear zone. The analysis of the data (reflection seismics, tomography) revealed the shallow structure of the Wadi Arava fault (main strand of the DST) down to a depth of ~1km. The main findings are published in Maercklin (2004) and Haberland et al. (2007).

2. Data Acquisition

2.1 Experiment design and schedule

For this experiment 8 seismic lines were successively deployed in the Arava/Araba valley in Jordan between 21.10. and 3.11.2001 (Figure 1). Data acquisition was accomplished by a cable-based seismic multichannel system which was deployed in a fixed spread (for each of the lines). Small chemical explosions were used as seismic sources (300g of chemical explosions detonated in 1-1.5m deep boreholes).

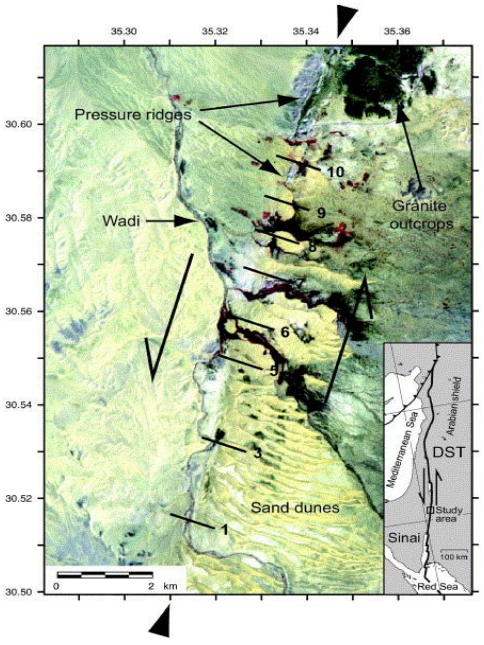

Figure 1: Location of the CSA-2 seismic lines in the Central Arava/Araba Valley (Jordan; after Haberland et al., 2007).

2.2 *Geometry/Location*

Shot and receiver coordinates are listed in file *INFO/csa2geom.dat*.

2.3 Instrumentation

We used a SUMMIT seismic multichannel recording system (200 channels) equipped with 4.5Hz geophone strings (vertical component; strings of 6 geophones).

2.4 Acquisition parameters

Parameter	*value*
Number of profiles	8
Length of each profile	1000m
Sensor spacing	~5m (200 channels / line)
Shot spacing	~ 20 m (51 shots / line)
Sampling rate	0.0625 ms (field files) 1.0000 ms (this data compilation)
Acquisition length	2.0480 s

3. Data Processing

Data processing (for the archived data set) included format conversion, geometry installation and resampling from 1/16 ms to 1ms.

4. Data Description

For each seismic line one SEG-Y file contains the recordings of all receivers and all sources along the respective line.

4.1 File format (s)

Data is stored in SEGY format (e.g., Barry et al., 1975). Header word settings are as follows (coordinate reference* is UTM-N = 3300000.0 m, UTM-E = 700000.0 m (UTM zone 36, ellipsoid = WGS-84):

Seismic Unix header	*SEG-Y header byte no.*	*Length (bytes)*	*CSA-2 header settings*	*Value, if constant*
tracl	0	4	trace number within this file	
tracr	4	4	trace number within this file	
fldr	8	4	field record number = shot point number	
tracf	12	4	receiver channel number	
ep	16	4	shot point number (=fldr)	
cdp	20	4	CDP ensemble number	
cdpt	24	4	trace number within CDP ensemble	
trid	28	2	trace identification code	1
nhs	32	2	number of horizontally stacked traces	1
offset	36	4	distance source receiver in dm	
gelev	40	4	elevation at receiver location in dm	
selev	44	4	elevation at source location in dm	
scalel	68	2	scale factor for bytes 40-67	-10
scalco	70	2	scale factor for bytes 72-84	-10
sx	72	4	relative* E coordinate of source in dm	
sy	76	4	relative* N coordinate of source in dm	

gx	80	4	relative* E coordinate of receiver in dm	
gy	84	4	relative* N coordinate of receiver in dm	
counit	88	2	coordinate units code	1
delrt	108	2	delay recording time (pre-trigger) in ms	
ns	114	2	number of samples per trace	2048
dt	116	2	sampling interval in microseconds	1000
year	156	2	year data recorded	2001
grnors	170	2	component identification code (1=Z, 2=N, 3=E)	1
grnofr	172	2	receiver channel number (=tracf)	
grnlof	174	2	CSA-2 line number	

4.2 Data content and structure:

file name	*shots*	*traces*	*size (bytes)*	*acquisition date*	*comment*
SEGY/hires1.sgy	50	10000	84323600	03.11.01	Line 1
SEGY/hires3.sgy	50	10000	84323600	01.11.01	Line 3
SEGY/hires5.sgy	48	9600	80950800	30.10.01	Line5
SEGY/hires6.sgy	50	10000	84323600	21.-22.10.2001	Line 6
SEGY/hires7.sgy	49	9800	82637200	28.-29.10.2001	Line 7
SEGY/hires8.sgy	49	9800	82637200	23.10.01	Line 8
SEGY/hires9.sgy	47	9400	79264400	25.10.01	Line 9
SEGY/hires10.sgy	49	9800	82637200	27.10.01	Line 10
INFO/csa2geom.dat					geometry
INFO/segy.txt					README

5. Data Quality/Accuracy

The recording system was triggered by the explosion, so temporal accuracy is better 1/16 ms. All coordinates were measured with a differential GPS system providing a location accuracy of around 50cm. The explosive source produced in part large ground roll which is often clipped at short-offset traces.

6. Data Availablity/Access

Data is archived at the *GIPP Experiment and Data Archive* where it is freely available for further use. When using the data, please give reference to this data publication and to Haberland et al. (2007). Recommended citation for this publication is:

> N. Maercklin, C. Haberland, T. Ryberg, A. Schulze and M. Weber (2013): Seismic data of the DESERT Controlled Source Array II (CSA-2; Arava Valley, Jordan, Oct./Nov. 2001). Scientific Technical Report STR Data 13/03; doi: 10.2312/GFZ.b103-13036; Potsdam.

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