

# Introduction to SEISAN

and

## Computer exercises in processing earthquake data with SEISAN

Jens Havskov<sup>1</sup>, Lars Ottemöller<sup>1</sup> and Peter Voss<sup>2</sup>  
(jens.havskov@geo.uib.no)    (lars.ottemoller@geo.uib.no)  
(pv@geus.dk)

<sup>1</sup>Department of Earth Science  
University of Bergen  
Bergen, Norway

<sup>2</sup>Geological Survey of Denmark and Greenland  
Copenhagen, Denmark

November, 2015

Preface .....	1
EXERCISE 1 .....	3
SEISAN basics .....	3
1.1. Overview of SEISAN .....	3
1.2. Installation of SEISAN and training data .....	4
1.3. Basics of the SEISAN database .....	5
1.3.1. REA directory and database .....	6
1.3.2. Waveform data, the WAV directory .....	8
1.3.3. Calibration data, the CAL directory .....	8
1.3.4. Parameter files, the DAT directory .....	8
1.4. Basic SEISAN exercises .....	9
1.5. Interactive work with the data base using EEV .....	9
1.6. Selecting data from the database and making an epicenter map .....	11
1.6.1. Mapping events with Google Earth .....	12
1.7. Putting new data into the database .....	13
1.8. Plotting digital data .....	14
1.8.1. Plotting events directly with MULPLT without using the database .....	15
1.8.2. Plotting continuous data from SEISAN continuous data base .....	15
1.8.3. Plotting one file from continuous data base NSS: .....	16
1.8.4. Plotting 24 hours, one channel .....	16
1.8.5. Plotting continuous data from an archive .....	16
1.8.6. Plotting event data in an archive from EEV .....	17
1.8.7. Plotting data from a large SEED or MiniSEED file .....	17
1.8.8. Putting a new digital recorded event into the database .....	18
1.9. Using SeisanExplorer .....	18
1.9.1. Open TEST data base and read in all events .....	19
1.9.2. Navigate in TEST data base .....	19
1.9.3. Actions with a single event .....	19
1.9.4. Actions with multiple events .....	19
EXERCISE 2 .....	21
Signal processing and phase reading .....	21
2.1. Phase reading and location of a local event .....	21
2.2. Phase reading and location of a distant event .....	22
2.2.1. Automatic mapping the event in Google Earth after location .....	23
2.2.2. Map epicenter in a browser with Google Maps .....	23
2.3. Theoretical travel times .....	24
2.3.1. Compare local travel times to IASP91 travel times .....	24