

MULTICOMPONENT SHEARWAVE SEISMOLOGY: THE CASE STUDY OF MILET (TURKEY)

S. Wölz and W. Rabbel

Institute of Geosciences, Geophysical Division, Kiel University, Germany.

swoelz@geophysik.uni-kiel.de/Fax: [+49] 431-880-4432

A two dimensional four component shearwave seismic experiment was conducted within the scope of an archeometric survey in the alluvium of Lion Bay, in the former harbour of the ancient town of Milet (western Turkey). We investigated the validity of two-dimensional, and close meshed recorded shearwave data for locating small spatial objects. Single profiles have been subsequently recorded, using shearwave geophones with two horizontal recording directions, arranged orthogonally to each other, in combination with two source directions, also orthogonally. The shearwaves were activated by a sledge-hammer, and recorded on a 48m square area, with a geophone distance of 1m in each direction. The two-dimensional wave field recordings resulted in a high quality 3-D dataset for each geophone and source direction with a very good signal to noise ratio. The two-dimensional measurement of the wave field allows accurate studies of the different phenomena of wave propagation, e.g. the scattering of ground roll and the influence of spatial refractor topography. It is possible to simulate any source and geophone orientation afterwards by elementary vector operations, such as vector addition and rotation of the coordinate system. The results are visualized as time-slice sequences and volumetric pictures, and are compared with 3-D modelling and 2-D refraction seismic results.