



Reflection seismic studies in the Forsmark site, central Sweden

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Reflection seismic data were obtained in two stages at Forsmark, Sweden (located about 140 km north of Stockholm). The goals of the surveys were to locate potential fractures zones in the Forsmark area as part of the site investigations for choosing the location Sweden's high-level nuclear waste repository. In stage 1, five profiles were acquired in the Autumn of 2002 using an explosive source. In stage 2, ten additional profiles were acquired in the Autumn of 2004 using both an explosive source and a mechanical hammer source. Acquisition parameters were optimized to provide a high resolution image of the uppermost 1 km by using a 10 m source and receiver spacing with a minimum of 100 active channels and a total profile length of about 40 km. High quality images were obtained along the profiles and several fracture zones were identified that had to be avoided in siting the repository at about 500 m depth. We have now reprocessed data from a number of the profiles with the aim of obtaining better quality images of the deeper levels in the area. Main processing steps included refraction statics, time variant spectral whitening, bandpass filtering, velocity analysis and stacking. Improved images of the deeper levels were obtained by decreasing the frequencies in the low end of the spectral whitening and the bandpass filter. The new images provide new insight into the larger scale structure in the area and can potentially be correlated with more regional seismic data to the southwest.