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# Spatial and temporal variations of the stress field in the South Iceland Seismic Zone before and after the two M=6.5 earthquakes of June 2000.

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In June 2000, the South Iceland Seismic Zone (SISZ) was struck by two M=6.5 strike-slip earthquakes, only four days and 17 km apart. During the nine years preceding the earthquake, the digital, high resolution SIL seismic network covered the area, recording tens of thousands of earthquakes down to magnitude zero. In this study we utilise the SIL database in order to investigate the stress field in the SISZ, obtained by inversion of the the earthquake focal mechanisms.

We apply the Spectral Amplitude Grouping technique, and also use high accuracy relative relocation where available, in order to be able to form small clusters of events for the stress inversion, tightly grouped in space and time. In order to account for uncertainties in the focal mechanisms, we utilise the range of acceptable focal mechanisms for each event available in the SIL system.

We show how stress varies both spatially and temporally in the zone. We study in detail the behaviour of the local stress fields in the two areas which are to become the hypocenters of the large earthquakes. We also investigate how the stress field varies as the crust readjusts after the large events and how stress release varies in the four quadrants of the main earthquakes. We discuss the difficulty of estimating uncertainties for the obtained stress fields and the effects of stress variations on the SISZ strain field.