

Long term seismic and seismologic monitoring of stress and fluid dynamics in the upper crust.

A letter of interest by

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The project DUSEL provides an excellent possibility of a long term monitoring of physical properties and microseismic activity of the upper crust. Deploying sensors (e.g., multi component geophones) and combining them in permanent 3-D ARRAYS could be a unique methodic feature of this project. This will allow a high-resolution monitoring of a broad range of physical processes. For our group the following observations could be of especial interest:

- Temporal changes of elasticity (seismic velocities) and of its anisotropy. Correlation of such observations with deformations.
- Seismicity and seismic noise (microseismicity and microseisms) with possible contribution to understanding fluid-related tremors and processes of seismicity triggering as well as stress corrosion.
- Pore pressure effects and its correlation to geochemistry, seismicity and deformations.
- Tidal-, seasonal-, climatic, - and tectonics dependencies of physical rock properties and their relations to the short-time (10 year scale) relaxation processes.
- Monitoring and calibration of seismic reflections and their relations to hydraulic and pore space parameters.
- High frequency monitoring of teleseismic activity.

Such observation and additional reflection seismic profiling, cross hole or/and VSP observations will provide data interesting for a broad geophysical community.

Our group will be very interested in processing and analyzing such data.