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Updates on site characterization at the proposed Lausitz, Saxony, ET candidate site

In August 2024, the Free State of Saxony officially declared its support for the ET site location bit for building the Einstein Telescope in the Lausitz (eng. Lusatia) region. The basement of this region is formed by the Lausitz Granodiorite Massif. The regional extent of the granodiorite is not known for certain, and recent observations contradict the historic geological maps in some locations. To test whether the granodiorite is a suitable host with properties benefiting ET, a large geophysical/geological survey is currently being conducted. This survey aims to produce a high-resolution 3D model of the massif and to study the regional seismic noise conditions.

Since 2021, two seismometers in a borehole doublet and one surface broadband seismometer have recorded seismic activity within the center of the target area near the town of Cunnewitz. We compare the seasonal variations and spectral footprint at the surface with those measured in the subsurface. Eight additional boreholes are currently being prospected and drilled and will be instrumented with broadband seismometers as they are completed.

We conducted a 15 x 15 km large seismic array deployment consisting of 191 short-period and 8 broadband stations in the target region, which have been used to construct the shallow S-Wave velocity structure. This deployment will be renewed towards the east to cover the full target region of the ET. Furthermore, 100 short-period stations were deployed in January/February 2025 to characterize the annual changes in the seismic noise. Additional active seismic experiments and reflection/refraction experiments have been carried out to characterize the seismic properties. These results are compared with in-situ measurements at the boreholes and in the lab.

In this talk, I will give an overview of the current status of the project, ongoing measurements, and planned work in the near future. I will highlight the results of the local ambient noise study, active seismic lines, borehole core analysis, the development of a combined geological model, and simulations of the ambient noise field at the surface and at depth.

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