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The nature of the Albstadt Shear Zone, Germany

Sarah Mader[1], Klaus Reicherter[2], Joachim Ritter[1], and the AlpArray Working Group
[1]Geophysical Institute, Karlsruher Institute of Technology, Karlsruhe, Germany
[2]Neotectonics and Natural Hazards, RWTH Aachen, Aachen, Germany

The region around the town of Albstadt, SW Germany, is one of the most seismically active regions in Central Europe. In the last century alone three earthquakes with a magnitude greater than five happened and caused major damage. The ruptures occur along the Albstadt Shear Zone (ASZ), an approx. 20-30 km long, N-S striking fault with left-lateral strike slip. As there is no evidence for surface rupture the nature of the Albstadt Shear Zone can only be studied by its seismicity.

To characterize the ASZ we continuously complement the earthquake catalog of the State Earthquake Service of Baden-Württemberg with additional seismic phase onsets. For the latter we use the station network of AlpArray as well as 5 additional, in 2018/2019 installed seismic stations from the KArlsruhe BroadBand Array. We inverted for a new minimum 1D seismic velocity model of the study region. We use this seismic velocity model to relocalize the complemented catalog and to calculate focal mechanisms.

The majority of the seismicity happens between the towns Tübingen and Albstadt at around 9°E in a depth range of about 1.5 to 16 km and aligns north-south. Additionally, we see a clustering of events at the towns Hechingen and Albstadt. The dominating focal mechanism is strike-slip, but we also observe minor components of normal and reverse faulting.
Our results image the ASZ by its mainly micro-seismic activity between 2011 and 2018 confirming the N-S striking character, but also indicating a more complex fault system.

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