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Preliminary results about the Quaternary activiy of the Ovacık Fault, Eastern Turkey

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The Erzincan Basin and the surrounding region have a complex structure, which is formed by the interaction of the North Anatolian Fault (NAF), the Northeast Anatolian Fault (NEAF), the Pülümür Fault (PF), and the Ovacık Fault (OF). The region has been shaked many times by devastating earthquakes throughout both the instrumental and the historical periods. The infamous 26 December 1939 Erzincan Earthquake (M∼7.9) is the largest event, which was instrumentally recorded along the NAF. Moreover, the eastern continuation of the surface rupture of this earthquake, “the Yedisu Segment”, is known as one of the two seismic gaps on this dextral shear zone. We started multi-disciplinary studies on the OF, which has relatively very limited data. Even though some researches think about this tectonic feature as a non-active fault, recent GPS measurements point strain accumulation along it. In addition to that 1992 Erzincan and 2003 Pülümür earthquakes loaded additional stress on the neighboring faults, including the OF.

The OF elongate between the SE Erzincan Basin and Kemaliye (Erzincan) about 110 km with a general strike of N60E. The clear morphological expression of the fault is especially observed around Ovacık, Tunceli. The OF delimits the Jurassic aged Munzur limestone in the north and the Miocene volcanoclastics and Permo-Carboniferous schist in the south in this vicinity. We identified many offset features, such as wash plains, moraines, alluvial fans and inset terraces in our preliminary morphological maps. The measured displacements change from 20 to 350 m, which may play a critical role in the calculation of the geological slip-rate. Moreover, we used morphological indices, such as topographic profiling, hypsometric integral, basin asymmetry, and the mountain front sinuosity to quantify the activity of the OF. Our preliminary results clearly point out the necessity of future studies, which may help to understand the earthquake potential of this poorly known tectonic feature.