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A new paleoseismological investigation across the Paleochori-Sarakina Fault, Northern Greece: Trenching exposures of the surface rupture of 1995 Ms 6.6 Kozani-Grevena earthquake

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The preliminary results from a new paleoseismological investigation carried out along the Paleochori-Sarakina fault segment, West Macedonia, Northern Greece, are presented. The Paleochori-Sarakina fault is a SW-NE trending north-dipping normal fault, which was ruptured during the 13th May 1995 devastating earthquake (Ms = 6.6) that affected the Kozani-Grevena area. The 10-km-long Paleochori-Sarakina fault is expressed as a complex, 15- to 50-m-high escarpment on early-middle Miocene molassic sediments of the Meso-Hellenic trench and it forms the southeast segment of the Aliakmon river Fault system. A series of surface ruptures, with a maximum displacement of $\sim$10 cm, were created during the 1995 earthquake in the area between Paleohori and Sarakina villages. Several trenches were excavated along the Paleohori-Sarakina fault right after the 1995 earthquake and three previous faulting events were identified. Thermoluminescence (TL) dating has been used to date the recognized paleoearthquakes. Recurrence interval based on these TL ages was 30 ka which was extremely high and the estimated slip-rate extremely low (0.01–0.03 mm/a). We excavated two new paleoseismological trenches near the Paleochori village in order to improve our knowledge on the Holocene tectono-stratigraphy of this structure and to obtain new samples for dating using an improved dating technique. The first trench was located 500 m southeast from the Paleochori village and was excavated across a 1.5-m-high north-facing fault scarp. The trench was 30 m long and up to 4 m deep. The second trench was located at the base of a 5-m-high scarp at the northeastern end of the Paleochori-Sarakina fault segment, south of the Paleochori village. The trench was 17 m long and up to 3 m deep. Both trenches intersect the fault zone which separates mollasic sediments exposed on the upthrown block from colluvial deposits of the downthrown block. The initial preliminary interpretation of the trench wall structure provided indications of recent reactivations of the fault. Numerous samples for Optically Stimulated Luminescence (OSL) dating have been collected and will permit to constrain the timing of the past earthquakes events observed in the trench and thus reconstruct the recent seismotectonic behavior. The preliminary OSL ages for a selected group of samples are also discussed.