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Luminescence Dating of Marine Terrace Sediments Between Trabzon and Rize, Eastern Black Sea Basin: Preliminary Results

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Quaternary marine terraces in the coastal region of Pontides in Northeastern Turkey are valuable archives of past sea level change. Until recently, dates of raised marine terraces undeciphered in the coastal region between Trabzon and Rize because of chronologic limitations. In this paper was to determine ages of the terrace deposits by applying optically stimulated luminescence (OSL) dating methods using single aliquot regenerative dose (SAR) techniques on quartz minerals from extracted marine terraces. Several samples were collected from three orders of Quaternary marine terraces which are reproducible at all sampling location in between cities of Trabzon and Rize, Turkey, coastal of Eastern Pontides, at the front of the thrust system. The terrace deposits mainly consist of clays, silts, sands and gravels. The sediments in these deposits are mainly derived from basaltic, andesitic, and limestone geology, and have elipsoid, square and flat shapes. The terrace deposits have heights ranging from 1 to 17 meters and increases in height and thickness from west to east. Initial OSL results from 1 mm and 3 mm quartz aliquots demonstrate good luminescence characteristics. Preliminary equivalent dose analysis results ranging from 17.6 Gy to 79.6 Gy have been calculated using the Central Age Model (CAM) and Minimum Age Model (MAM). According to ages obtained from three separate terrace is ∼8 ka, ∼42 ka and ∼78 ka, respectively. Results of marine terrace sediments indicate this region has three sedimentation periods and coastal region of Pontides has been remarkably tectonically active since latest Pleistocene to earlier Holocene. This study will present preliminary OSL dating results obtained from samples of Quaternary marine terrace formation.

Keywords: optically stimulated luminescence (OSL) dating, single grain, marine terraces, Eastern Pontides.