Paleoseismological studies along the un-ruptured southern segment of Yokote Basin Fault Zone, northeast Japan

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The mapping of active faults and how the associated earthquakes have repeated in space and time are the key to unraveling future seismic activity. With the advent of extensive paleoseismic and geodetic data, the more complex behavior of earthquake ruptures such as events incompletely rupturing or bleeding into adjacent segments is indicated (e.g. Zielke, et al., 2010; Bilham, et al., 2019; Katsube et al., 2017). The 1896 Rikuu earthquake, Mw 7.2, is one such example which ruptured 35 km of the northern section of the eastern margin of the Yokote Basin (EFZYB), which is one of the largest east-dipping fault system in northeast Japan (e.g. Matsuda, et al., 1980; Kagohara, et al., 2009) while leaving the southern section un-ruptured since at least 100 years. Since then tremendous efforts have been made along the ruptured section of EFZYB to determine slip rates and recurrence interval of the earthquakes (Kagohara, et al., 2006; 2009; Imaizumi et al.,1997; Research Group for the Senya Fault, 1986). However, the trace of the active faults, slip rates, past earthquake chronology and recurrence intervals along the un-ruptured southern section of EFZYB remained poorly understood. Therefore, through detailed aerial photo interpretation, airborne LiDAR DEM survey, and field investigation an attempt has been made to map the active faults in the un-ruptured southern section of EFZYB, which is integrated with seismic survey and borehole data to determine slip rates. Here we will present the preliminary results of the work which will help in the seismic hazard assessment of the Yokote Basin.

Keywords: Active Fault, Borehole Survey, Slip Rates, LiDAR DEM, 1896 Rikuu earthquake

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