

## Paleoseismological study of the Central Part of the Nukumi fault, the 1891 Nobi Earthquake Fault System, Central Japan

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It is important to evaluate the magnitude of earthquake caused by multiple active faults, taking into account the simultaneous effects. The simultaneity of adjacent active faults are often decided on the basis of geometric distances except for known these paleoseismic records. We have been studied the step area between the Nukumi fault and the Neodani fault, which appeared as consecutive ruptures in the 1891 Nobi earthquake, since 2009 fiscal year.

The purpose of this study is to establish innovation in valuation technique of the simultaneity of adjacent active faults in addition to the paleoseismic record and the geometric distance.

Topographic, geological and reconnaissance microearthquake surveys are concluded.

The present work is intended to clarify the distribution of tectonic geomorphology along the Nukumi fault by high-resolution interpretations of DEM and aerial photograph, and the field survey of outcrops and location survey. The study area of this work is the southeastern Nukumi fault from ca. 2km northwest of Nukumi pass. We interpret DEM using shaded relief map and stereoscopic bird's-eye view made from 2m mesh topographic data which is obtained by airborne laser scanner of Kokusai Kogyo Co., Ltd. Aerial photographic survey is for confirmation of DEM interpretation using 1/16,000 scale photo.

As a result of topographic survey, we found consecutive tectonic topography which is left lateral displacement of ridge and valley lines and reverse scarplets along the Nukumi fault. From Ogotani 2km southeastern of Nukumi pass to Kadomakidani 1.5km southeastern of Ogotani, we can interpret left lateral topographies and reverse scarplets in the terrace surface by DEM investigation. These topographies are unrecognized by aerial photographic survey because of vegetations.

We have found several new outcrops in the area where the surface ruptures of the 1891 Nobi earthquake have not been known. These outcrops have active fault which cut the layer of terrace deposit and slope deposit to the bottom of present soil layer in common. At the locality of Ogotani outcrop, the humic layer which age is from 14th century to 15th century by 14C age dating is deformed by the active fault.

The vertical displacement of the humic layer is 0.8-0.9m and the terrace deposit layer below the humic layer is ca. 1.3m. For this reason and the existence of fine grain deposit including AT tephra (28ka) in the footwall of the fault, this fault movement occurred more than once since the last glacial age.

We conclude that the surface rupture of Nukumi fault in the 1891 Nobi earthquake is at least continuous to 3km southeast of Nukumi pass. In other words, these findings indicate that there is 2 km parallel overlap zone between the surface rupture of the southeastern end of Nukumi fault and the northwestern end of Neodani fault.

Keywords: the 1891 Nobi Earthquake Fault System, Nukumi fault, tectonic geomorphology, aerial photograph interpretation, fault outcrop, Digital Elevation Model