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Subsurface geology of a tectonic bulge at Osso, central Neodani fault, based on road construction exposures

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On the up thrown side of the central Neodani fault at Osso, a terrace surface is locally deformed, forming a small tectonic bulge. We here report subsurface geology of this tectonic bulge based on exposures by the road construction (Kadowaki bypass construction) until December 2011, and examine its relation to the tectonic bulge.

We found that the tectonic bulge was formed by a simple localized uplift that has one uplift center, although the present bulge is composed of two mounds divided by an incised valley in between. The valley is thus interpreted as an antecedent valley that predates the initiation of the bulge growth and has continued to incise the bulge ever since. We also found that the deformed terrace surface is ˜40 ka based on radiocarbon ages from woods collected from the terrace deposits. On the basis of our drilling immediately behind the bulge that reveals presence of at least 4-m-think young sediment of 2 to 3 ka, a subsidiary fault is inferred along the northeastern side of the bulge in addition to the main fault on the other side.Based on a simple two-dimensional modeling assuming elastic deformation, a low-angle normal subsidiary fault is needed to reproduce the cross-sectional morphology of the tectonic bulge, although further research and analysis are necessary to examine its validity.

Keywords: tectonic bulge, active fault, tectonic geomorphology, Neodani fault