

Estimations of fault locations based on Ground Penetrating Radar survey around the western river mouth of the Fuji river

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The 1854 Ansei Tokai earthquake presumably generated wide uplift around the western river mouth of the Fuji river, Shizuoka prefecture, Japan. The uplift indicates that the rupture area of the 1854 earthquake can extend from the Nankai and Suruga troughs to the Iriyamase fault. To forecast earthquake processes in the future, it is important to identify locations and activities of the Iriyamase fault.

We surveyed locations of the Iriyamase fault by using Ground Penetrating Radar (GPR) instrument on 4th-8th January, 2016. Because a strike angle of the Iriyamase fault is nearly north-south direction (Headquarters For Earthquake Research Promotion, HERP, 2010), most survey lines were set to be west-east direction, which is basically perpendicular to the fault. Length of the total survey lines are 13 km. The frequency of the used radio wave is 100 MHz. This spec can detect reflections of the layers about 5 m deep from the ground.

As a result, we found discontinuity of the layers at least at four locations on the survey lines within 2 km inland from the shoreline. There seem to be offsets at the discontinuity between the west and the east layers. The discontinuity extends just below filling, and the offsets are considered to be generated relatively late years. The locations of discontinuity are close to the Iriyamase fault estimated by HERP, and two of them are also close to locations of the faults estimated from seismic reflection survey for several tens to hundreds meters deep (Ito et al., 2014).

On the other hand, we also found the discontinuity at the north of Kambara junior high school and the east of old Ihara high school, which are apart from the locations of the Iriyamase fault. This indicates that the Iriyamase fault consists of splay faults as Ito et al. (2014) reported.

References:

Headquarters For Earthquake Research Promotion, 2010,

http://jishin.go.jp/main/chousa/katsudansou_pdf/43_fujikawa_2.pdf

Ito S., Yamaguchi K., and Iritani R., 2014, Annual Report of Investigations Geology and Active Faults in the Coastal Zone of Japan (FY2013), 59-64.

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