



Growth of faults system in Western Nagano (Japan) determined by the Differentiated Tomography,

L.A. Sim (1), T.A. Smaglichenko (2), and A.V. Smaglichenko (3)

(1) Institute of Physics of the Earth, Russian Academy of Science, Moscow, Russia sim@ifz.ru/Fax +007-495-255-6040 , (2) Institute of Oil and Gas Problems, Russian Academy of Science, Moscow, Russia smaglich@mail.ru/Fax: +007-495-255-6040 , (3) Institute of Steel and Alloys, State Technology University, Moscow, Russia Losaeylin@mail.ru/Fax +007-095-237-8007

A system of faults has been revealed applying Differentiated Approach (DA) of tomography to a precise seismic data collected by regional seismic network from 1995 to 1998 in Western Nagano, central Japan. We found an extremely low velocity zone ($V_p = 4.6$ km/s), which accurately corresponds to the thin main fault plane as it was reported by Japanese Meteorological Agency (JMA) yet in 1986 just after Naganoken-Seibu earthquake with M6.8. This plane has the N oriented dipping steep angle. The detailed DA velocity images showed that the main fault is still not healed except the depth ranges 0.3-0.6, 1.2-1.5, 2.7-3.0 km, on which a fragmentation of rocks was likely not completed during the main shock. There is a clear correlation between events relocated with DA and strong low velocity anomalies at eastern end of the main plane. Such character of seismicity determines other faults, which have different orientations with respect to the main fault in its northern and southern wings. Projections of planes of these faults are detected as lineaments, which have similar positions in slides at different depths. There are two planes, which are sub-perpendicular to the main fault in its northern wing, and they are falling to the S direction. Other plane, which is parallel to the main fault, has been found in its southern wing. Also we pointed that at eastern end of the fault at whole a set of relocated hypocenters is distributed in different wings by different ways. So, a large number of events correspond to clusters, which have a various extension in northern and southern wings of the fault: namely, at northern wing one cluster stretches to the E direction while at southern wing the other cluster extends to the W direction from the fault. Note, at northern wing a cluster continue expand to the N direction from the fault. Such distribution of relocated hypocenters can be explained by means of focal mechanism type of the main shock, which in accordance with JMA has the fault type of a right lateral strike slip. Under such mechanism there is a different tectonic stress at the end of the main fault. The area of local compression is formed in northern wing, while the area of local stretching is in southern wing. In both cases the compression and stretching axes are parallel to the main fault plane. We conclude that after the main shock, which happened in 1986 in the Nagano region, the tectonic stress field leads to the growth of faults system around an eastern end of the main fault.