

6 FAULTING MECHANISM AND AFTER-SHOCK ACTIVITY

The focal plane solutions computed by different institutes in Japan and other countries are listed in Table 6.1 and they are shown in Figure 6.1. The fundamental mode of faulting was thrust-type. Many institutes could not distinguish the causative fault from the computed mechanisms. However, the after-shock activity indicated that the fault having a NE-SW strike and inclined towards NW was contemplated as the causative fault. The subsequent large aftershocks had similar characteristics to the main fault and they migrated along a NE direction following the main shock. The focal plane solutions for some after-shocks indicated of sinistral lateral strike slip near the northern tip of the fault (Figure 6.2). However, the inclination of this fault is about 47-53degrees and it is steep for thrust faults (Figure 6.3). The fault plane is about 23km long and 14km wide.

The fault terminated at a depth of 5km from the ground surface and it may be designated as a blind-thrust fault. Since the top Neogenic layers are folded and very soft, these soft layers may accommodate the relative ground deformations so that fractures on the ground surface could not become visible on the ground surface. The investigation by the active fault research group of Japan Geological Survey and other institutes could not find any noticeable ground fractures associated with thrust faulting in the earthquake-affected area. They concentrated their investigations on the Obirao fault area where the fault ruptures were expected if the causative fault was extrapolated to the ground surface. However they noticed some peculiar ground deformations in the vicinity of Hirokami village.

Table 6.1: Parameters of main shock computed by various institutes

Institute	Latitude	Longitude	Depth (km)	Magnitude (Mw)	NP1 Strike/dip/rake	NP2 Strike/dip/rake
JMA	37.28	138.87	13	6.7	213/58/92	28/32/86
NIED	37.254	138.879	13.3	6.6	212/47/93	27/43/87
ERI	37.30	138.80	8	6.6	223/57/89	45/33/92
USGS	37.24	138.72	16	6.4	233/47/105	32 /45/75
HARVARD	37.29	138.86	17.5	6.6	209/51/93	23/39/86

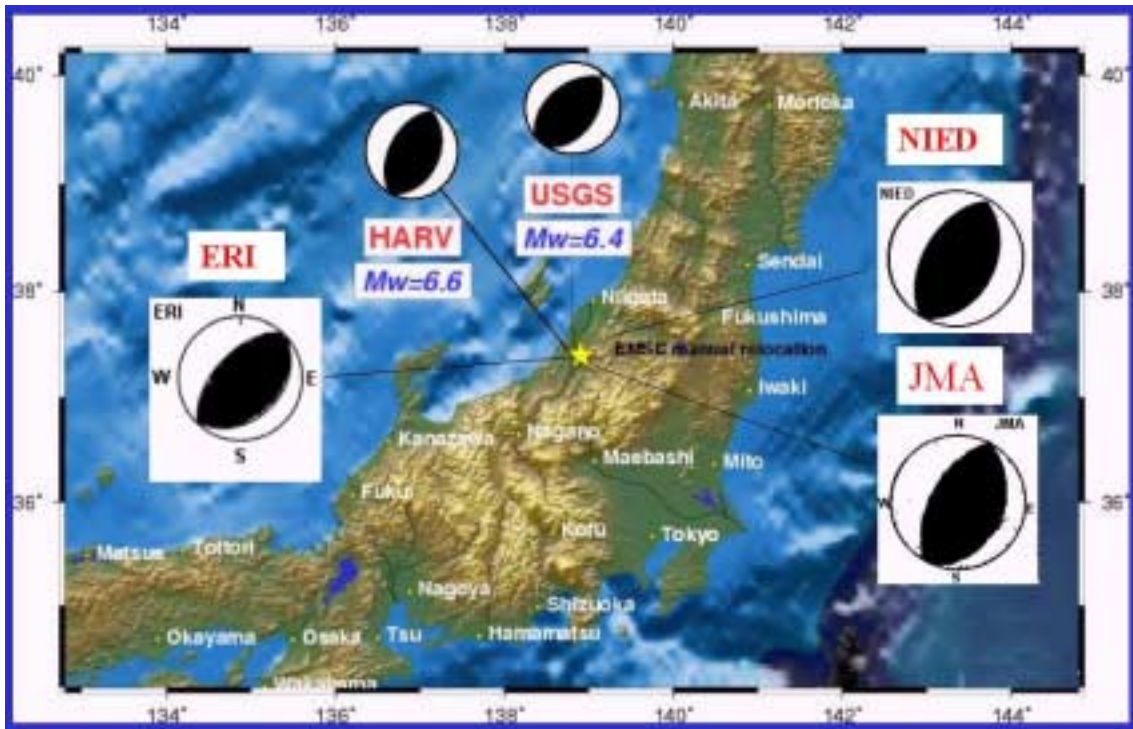


Figure 6.1: Faulting mechanism computed by various institutes (arranged from EMSC)
 2004/10/23 17:50--2004/10/27 16:00 (N=2371)

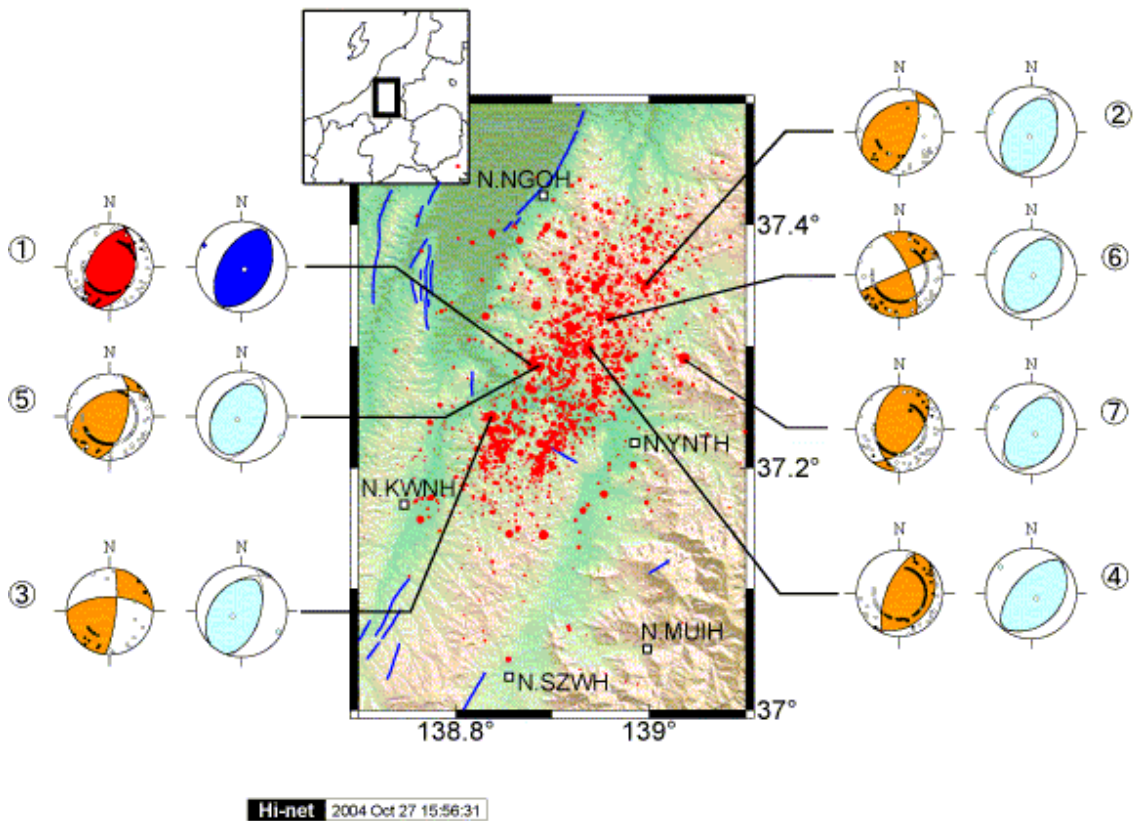
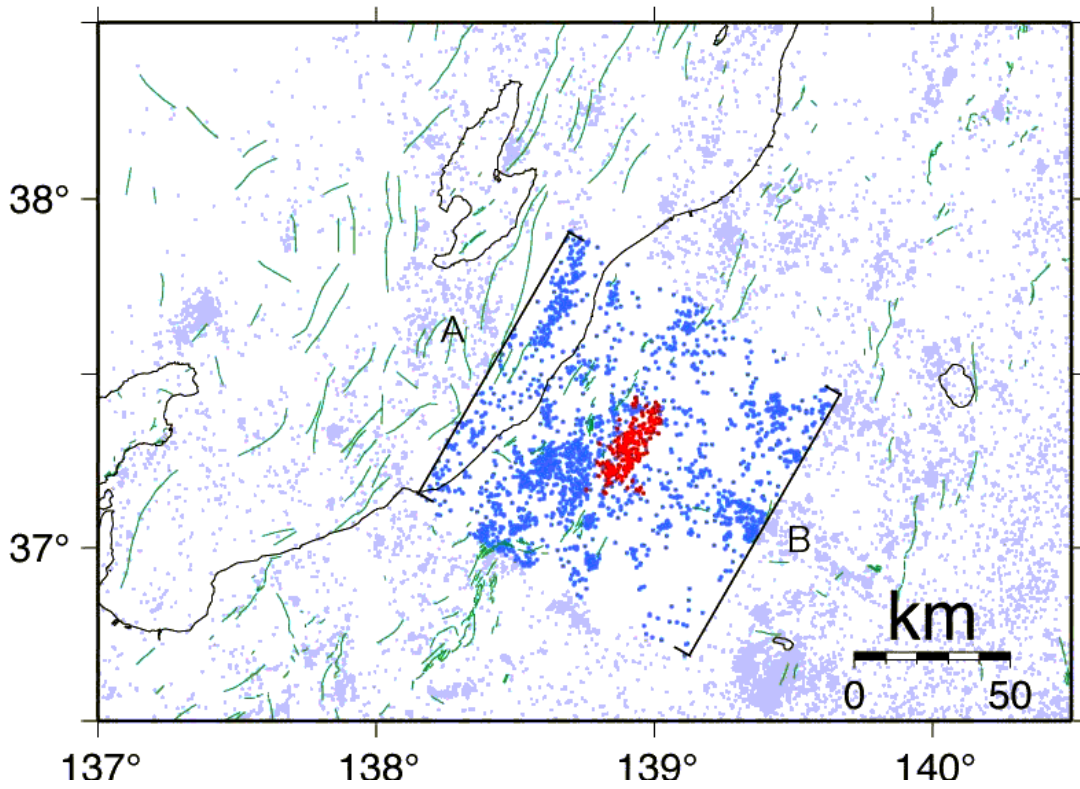
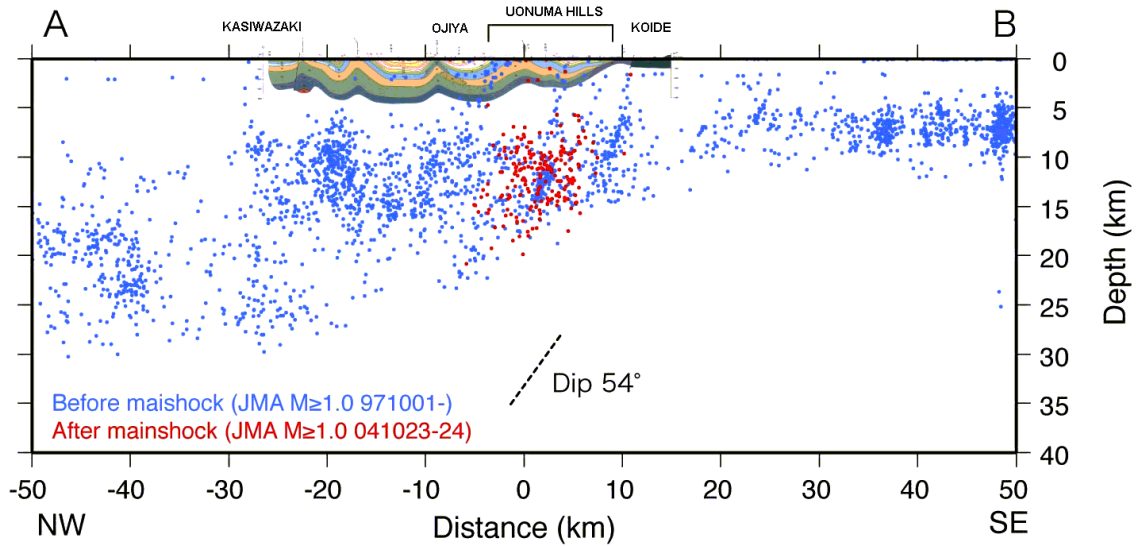


Figure 6.2: Faulting mechanism of main and large aftershocks by F-Net of NIED



(a) Areal after-shock activity



(b) A cross-section of locations of aftershocks along A-B line

Figure 6.3: Aftershock activity and inferred causative fault