

The unique characters of intensity distribution of the 2018 Sep. 6 Mw6.6 Earthquake of Iburi region in Hokkaido, Japan

*Ritsuko S. Matsu'ura¹, Hiroto Tanaka², Mitsuko Furumura¹, Tsutomu Takahama²

1. Earthquake Research Center, Association for the Development of Earthquake Prediction, 2. Kozo Keikaku Engineering Inc.

On Sep. 6, 2018, the Mw6.6 (M_{JMA} 6.7) earthquake of 35km depth (JMA depth 37km) occurred in the eastern part of Iburi region, Hokkaido, Japan. Waves from this event are characterized by the very high level in high frequency part. Although it is just an Mw6.6 earthquake, and the shortest distance to the land is larger than its depth, Japanese Instrumental Seismic Intensity (JISI) 7 was recorded at Shikanuma station, 43km away from the source. The comparison of observed waves with the various prediction equations of PGV or PGA for Japan, such as Si and Midorikawa(1999) shows that the observation was remarkably larger than most equations in distances less than 50km [e.g. Nishimura and Miyakoshi (2018)].

We applied the new prediction equation of JISI, which was classified by the physical source types, and in which the surface ground effect was removed by the term dependent on AVS30 of each station [Matsu'ura et al. (2018)], to this event. The equation for the PAC-intra type fits well to stations in distances less than 100km, while the equation for the PAC-inter type fits well to further stations in Iwate or southeastern part of Hokkaido (Fig.). It apparently shows the high stress-drop source feature like an event of intra slab, but the abnormal intensity effect due to the PAC is weaker than that of the PAC-intra type, and similar to that of the PAC-inter type. These features are well explained when this Mw6.6 event occurred within the rather cold shallow mantle overriding on the slab on the western foot of Hidaka Mountains. The high frequency waves were transferred very efficiently from the source to the PAC slab like those from interplate events, which suggests that the source lies in fairly homogenous area than the ordinary Japanese crust.

This study was done as a part of the Supporting Project for the Headquarters for Earthquake Research Promotion (HERP) sponsored by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan.

References

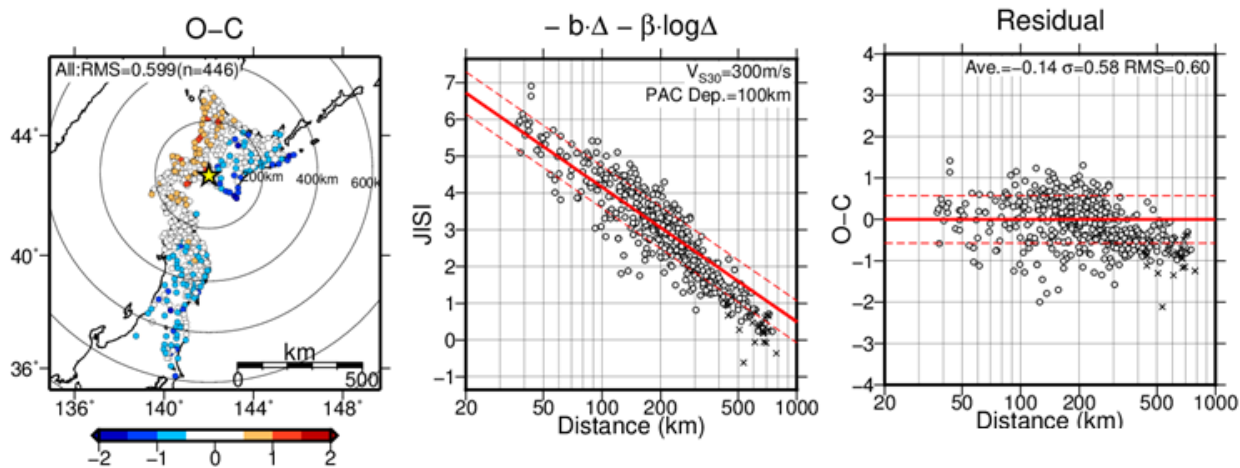
Matsu'ura, R. S. et al. (2018). A new multidimensional prediction equation of instrumental seismic intensity of Japan reflecting source type characteristics, submitted to BSSA.

Nishimura, T., and K. Miyakoshi (2018). Comparison of Hokkaido-Iburi-Tobu earthquake with existed prediction equations of ground motions, Fall meeting of Seismological Society of Japan, S25-P19.

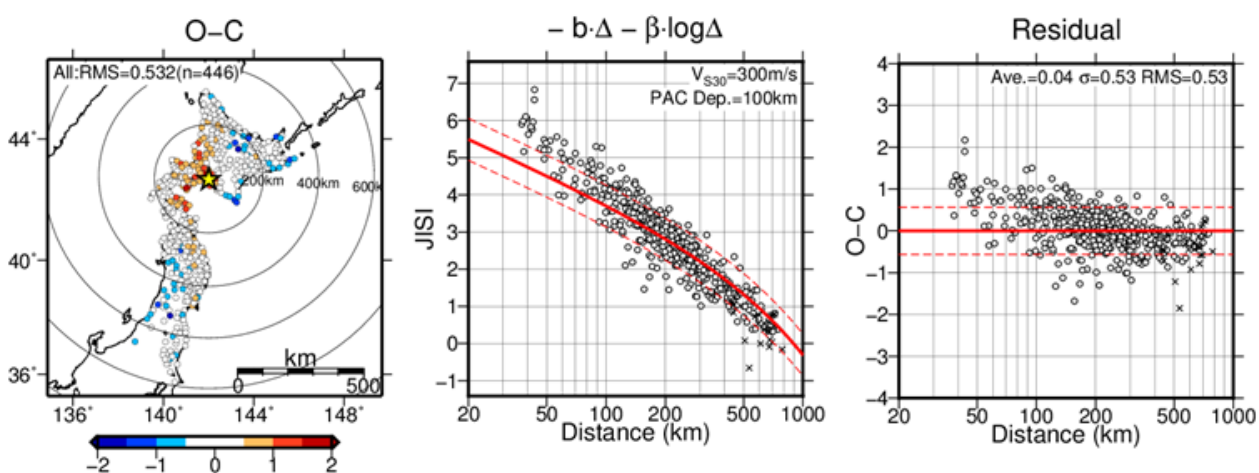
Si, H. and S. Midorikawa (1999). New attenuation relationships for peak ground acceleration and velocity considering effects of fault type and site condition, J. Struct. Constr. Eng. AIJ, 523, 63-70.

Keywords: Prediction Equation of Japanese Instrumental Intensity, 2018 Sep. 6 Mw6.6 Earthquake of Iburi region, earthquake in the uppermost mantle

2018/09/06-03:08 Mj6.7 Mw6.6 Depth35.0km



comparison with the PAC intra prediction equation



comparison with the PAC inter prediction equation