

The 2016 Kumamoto earthquake M7.3

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1. Introduction

01:25 on April 16 M7.3 earthquake occurred in Kumamoto prefecture and JMA Intensity 7 was observed. There were M6.5 and M6.4 two big foreshocks. M6 foreshock is rare case in Japan. Only one event was known such case. It was that off Boso M7.5 1909 earthquake had M6.7 foreshock.

M7.3 mainshock induced new seismic activity in Aso region and the central Ooita prefecture. These earthquakes were also researched.

2. The characteristics of each earthquake group

The Kumamoto M7.3 earthquake had so many aftershocks. It was the most number of aftershocks of inland event in Japan from 1997. The induced earthquakes by the Mainshock were occurred in Aso region and the central Ooita prefecture. The hypocenters of these earthquakes avoided the past source areas of 1975 M6.1 Aso earthquake and 1975 M6.4 west of Ooita earthquake and Mt. Kujyu volcano.

The fault plane solutions of large events are all strike slip (E-W compression and N-S tension)by Global CMT group.

The b-value of M6.4 on 2016/04/14 is 0.74 and some smaller than the b-value of the mainshock 0.85. But M5.0 earthquake occurred along the Hinagu fault on 2000 June 8 and its b value is 0.61. So, it is very hard to suppose that M6.5 was the foreshock by b-value. The b-values in west Aso followed M5.9 on April 16, in east Aso followed M5.8 and in the central Ooita were 0.9-1.0, 0.8, and 1.0.

3. Other problems

Intensity distribution of the mainshock showed that stations in east from the hypocenter were shaken hardly compared to other direction.

Past large earthquake inland Kyushu had never directly induced volcanic eruptions. Only the 1922 M6.9 earthquake in the Tachibana bay followed Aso eruption about one month later. But the source fault of the Kumamoto earthquake arrived at the end of Mt. Aso and it is the first case that the source of M7 event arrived at the volcanic area. So, we must observe volcanoes more carefully.

The hypocenter data of Hi-net automatically determined were very useful to check the seismicity. So, the hypocenter data is needed to keep them in homepage in long time.

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