

Time series analyses of the seismic activities in southwestern Japanese Island to southeastern Korean Peninsula excited by the deep fluid heat flow

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More than eight series of large damaging earthquakes occurred since November 2015 in southwestern Japanese Islands. They are as follows;

- 1) 2015/11/15 earthquakes of Northwestern margin of Okinawa Trough N31.33050°, E128.71733°, Depth: 9.4km, M5.9.
Foreshock: M5.1 (11/14), largest aftershock: M5.5 (2016/05/07).
- 2) 2016/04/16 2016 Kumamoto Earthquakes N32.75450° E130.76300°, Depth: 12.45km, M7.3.
Foreshock: M6.5 (04/14), M6.4 (04/15), largest aftershock: (04/16) M5.9.
- 3) 2016/09/12 earthquake of Southeastern Korean Peninsula N35.79817° E129.27167°, Depth: 36.0km, M5.8.
Foreshock: M5.2 (40 minutes before), Largest aftershock: M5.2 (2017/11/15).
- 4) 2016/10/21 earthquake of Central Tottori in 2016 N35.38050° E133.85617°, Depth: 10.61km, M6.6.
Foreshocks: low frequency earthquakes, aftershocks: containing low frequency earthquakes.
- 5) 2017/11/15 earthquake of Southeastern Korean Peninsula N36.19584° E129.39417°, Depth: 11.0km, M5.6.
- 6) 2018/02/11 earthquake of Southeastern Korean Peninsula N36.09883° E129.45700°, Depth: 4.0km, M4.6.
- 7) 2018/04/09 earthquake of Western Shimane Prefecture in 2018 N35.18467° E132.58667°, Depth: 12.13km, M6.1.
- 8) 2018/06/18 Northern Osaka Earthquake in 2018 N34.84433° E135.62167°, Depth: 12.98km, M6.1.

Positions of the former four earthquakes and the later four earthquakes shift from the west to the east. The number and scale of the earthquakes of Northwestern margin of Ryukyu Trough is reduced just several days before the 2016 Kumamoto Earthquakes, and the number and scale of them is just restored after the 2016 Kumamoto Earthquakes. This seems to have a strong relationship between the earthquakes of Northwestern margin of Okinawa Trough and the 2016 Kumamoto Earthquakes. This suggests that such two strongly related earthquakes may be driven by the migration of thermal energy because the earthquake activities are restored.

Seismic activity continued more than two years in the case of the earthquakes of Southeastern Korean Peninsula and large earthquakes often recurred there. Their hypocenters show remarkable distribution. That is to say, they distribute not along any plane but along three dimensionally bent lines. On the lines, earthquakes occurred from the bottom to the upper in the lower to the upper crust. This means that the earthquakes of southeastern Korean Peninsula occurred not in an elastomechanical system but other system as thermal energy. Next earthquakes, just after the earthquakes of southeastern Korean Peninsula, occurring in the central Tottori in 2016 contains large number of low frequency earthquakes through the foreshocks to the aftershocks. The main shock of the central Tottori in 2016 is actually driven by the thermal liquid energy.

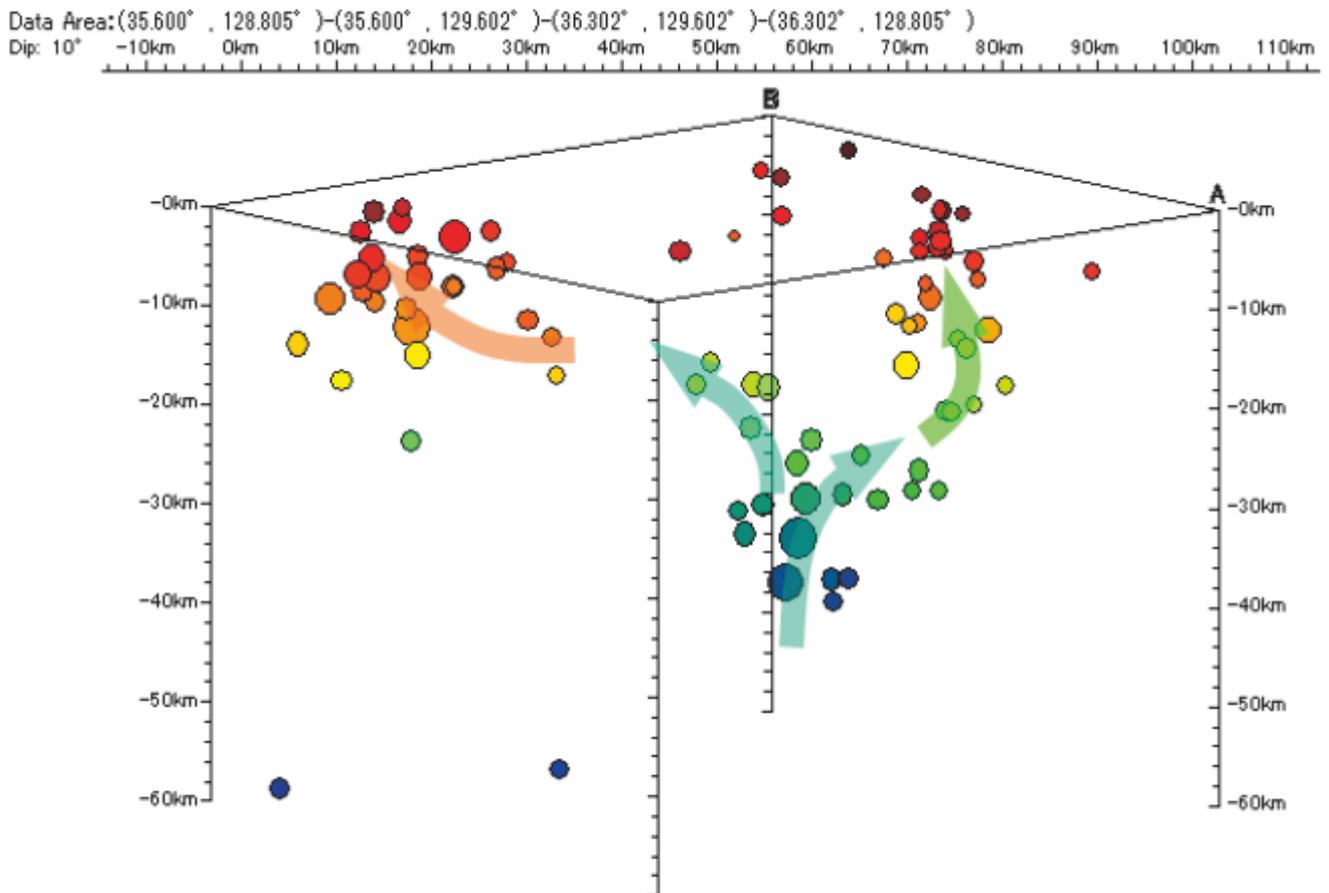
According to such evidences of the liquid flow causing the earthquakes, the large earthquakes occurring in

the upper crust of Southwest Japan would be driven by the eastward transmigrating thermal energy in the upper mantle (Tsunoda et al., 2013).

Reference:

Tsunoda, F., Choi, D.R. and Kawabe, T., 2013. Thermal energy transmigration and fluctuation. NCGT Journal, v.1, p.65-80.

Keywords: time series analyses of seismic activities, deep fluid heat flow, southwestern Japanese Island



Current: (84/84) 2018/02/18 03:34:27.06 M3.0
 断面線: N41.0° E
 2016/09/11 00:00:00 - 2018/03/01 00:00:00.