

Water level and temperature change of geothermal spring as a good indicator of a vectorial change of the local stress

KAWABE, Takayuki^{1*}, NAKANO Keiji²

¹Faculty of Education, Art and Science, Yamagata University, ²Terra-Fluid Systems

Water level and its temperature are changed at some geothermal wells located in Yamagata, southern Fukushima and northern Ibaraki Prefectures just after the 2011 off the Pacific coast of Tohoku Earthquake. Most of them are beared in fractures.

Such change of level and temperature of geothermal wells beared in fractures by a large earthquake is well known at previous large earthquakes as the Southern Hyogo Prefecture Earthquake in 1995 and the Niigata Chuetsu Earthquake in 2004, etc.

Water level and its temperature increase when the secondary local stress by a deformation of the surficial crust by the quake effects compressionally to the water-bearing fractures, and they decrease when the secondary local stress effects relatively tensionally to the fractures.

Thus the change of water level and its temperature of the geothermal wells beared in the fractures is a good indicator of a vectorial change of the local stress field.

Keywords: Water level and temperature change of geothermal spring, vectorial change of local stress field