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Roles of active faults for fluid-flow in the crust, examples from Chubu district, Japan

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Because of many seismic and volcanic activities in Japan, more than 27000 locations of hot springs are known to exist in Japan. Various kinds of studies of hot spring have been performed, but research areas for most of these studies were narrow with smaller numbers of samples. In comparative studies about the relationship between topography and geological structure and chemical composition of hot springs, many chemical composition data in broad region are required.

In Japan, hot springs are defined by law to be composed of hot water from underground, water vapor and other gases, and their temperature at the gushing points should be higher than 25 degree C, or containing some chemical components more than specific amounts. Chemical composition of hot springs reflects the geology (Maki 1994). It is obligated to analyze hot springs chemically and submit official sheets of chemical compositions by law. Oguma(2009) obtained 715 data of hot springs in Kanto-Koshinetsu area using these sheets and showed the relevance of the chemical composition of hot springs and plate subduction. Otsu(2010) and Terusawa(2012) used data of hot springs in Tohoku and Kyushu area, showed the relevance of chemical compositions and active faults. These studies were performed using temperature, pH and amount of chemical components data recorded in official sheets of chemical analysis.

The target area of this research is Chubu district, Japan. There are many volcanoes and active faults in Chubu area, so many hot springs exist. 3225 data of chemical composition of hot springs are collected from whole Chubu area, and chemical trend corresponding to the various geological setting are spatially analyzed on GIS. In this presentation, we report new insights about the relevance of several active faults and chemical composition of hot springs.

Keywords: hot springs, active faults, permeability, Chubu district