Japan Geoscience Union Meeting 2013
(May 19-24 2013 at Makuhari, Chiba, Japan)

SGL40-07 Room:201A Time:May 19 15:45-16:00

Incremental granitic magma emplacements in the Hida Mountain Range as revealed by comprehensive zircon U-Pb data

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The Hida Mountain Range (HMR) is the largest and highest mountain system in Japan. The HMR is known to have the highest uplift and denudation rates during the Quaternary in Japan. Granite is the dominant lithology in the HMR and many stages of granitic magma intrusion from Mesozoic to Quaternary have been recognized, while exact timing of magmatic intrusion has been unclear because ages were mostly determined by K-Ar and fission-track dating methods with relatively low closure temperatures.

In this study, a total of 34 granitic rocks were dated by the U-Pb method on zircons using LA-ICP-MS. All of the samples were collected in and around the Kurobegawa Granite. Some zircons were dated both at the center and rim of a grain by LA-ICP-MS and SHRIMP U-Pb dating was also performed. These experiments corroborated the reliability of the dating results.

It was found that in the HMR 65 Ma granite is widespread and several discrete magmatic activities occurred since 10 Ma. The latest activity was ˜0.8 Ma, which indicates the Kurobegawa Granite is the youngest exposed pluton on Earth.

Keywords: U-Pb dating, zircon, granitic magma, Hida Mountain Range