

SIT038-P01

Room:Convention Hall

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Evaluation of tilted uplift of the Kiso Range, central Japan, based on low-temperature thermochronology

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Fission-track (FT) and (U-Th-Sm)/He (He) analyses are used to constrain the denudation history and pattern of the Kiso Range, a Japanese fault-block mountain which has been uplifted since ~0.8 Ma. Zircon FT ages from 9 samples ranging from 59.3 to 42.1 Ma, apatite FT ages from 18 samples ranging from 81.9 to 2.3 Ma, and apatite He ages from 13 samples ranging from 36.7 to 2.2 Ma are reported. The apatite FT and He ages are divided into an older group and younger group. The younger ages are interpreted to reflect uplift of the Kiso Range because younger ages are obtained at a lower elevation for both the eastern and western slopes of the Kiso Range and the estimated event ages from apatite FT data are consistent with the initiation of the Kiso Range. Although distribution of the younger ages is asymmetric between the eastern and western slopes, the ages on the both slopes can be explained by subsequent denudation to the uplift of the Kiso Range by assuming westerly tilting uplift between the boundary fault of the Inadani fault zone and Seinaiji-touge fault. Elevations of the original surface are estimated at ~2700-4900 m. We also estimated denudation rates at ~1.3-4.0 mm/yr and maximum bedrock uplift rates at ~3.4-6.1 mm/yr for the sampling sites. The estimated elevations of the original surface imply an intermediate type of bedrock uplift between two existing models. Taking the intermediate model and some previous observations of the Inadani fault zone and Seinaiji-touge fault into account, the Seinaiji-touge fault is interpreted to be a back-thrust of the Inadani fault zone. The older group of the apatite FT and He ages is interpreted to reflect long-term peneplanation whose denudation rate is probably <0.1 mm/yr.

Keywords: fission-track thermochronology, (U-Th-Sm)/He thermochronometry, Kiso Range, denudation, tilted uplift