[JJ] Evening Poster | S (Solid Earth Sciences) | S-GL Geology

[S-GL30]Geochronology and Isotope Geology

convener:Takahiro Tagami(Graduate School of Science, Kyoto University), Yuji Sano(Division of Ocean and Earth Systems, Atmosphere and Ocean Research Institute, University of Tokyo)
Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Reliable reconstruction of geohistory is of primary importance to better envision the present and future of the Earth. Geochronology and isotope geology play major roles in the reconstruction. This session offers an opportunity to present the results of fundamental studies, including the developments / improvements of analytical methods and age calibration, as well as applications to the Earth and planetary materials. We particularly focus on: (1) radiometric dating, bio-stratigraphy, magneto-stratigraphy and stable isotopic time series that provide the age information, (2) radioisotopes and stable isotopes widely employed for analyzing the Earth and planetary systems and (3) hypothesis and numerical modeling that utilize / assimilate the age and isotopic data. We also welcome contributions that integrate a variety of relevant disciplines.

[SGL30-P05]Thermal history of the Higher Himalayan Crystallines and over-underlying sediments in west-central Nepal, revealed by zircon fission-track dating

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Keywords:fission-track ages, Himalaya, nappe

Zircon fission-track (ZFT) dating was carried out along 120 km long transect across the Himalaya: from Mt. Annapurna to the Main Boundary Thrust (MBT) in west-central Nepal. We newly obtained 23 ZFT ages from the Higher Himalayan Crystalline, the overlying Tibetan Tethys sediments (TTS) and the underlying Lesser Himalayan sediments (LHS), and discuss cooling process of each geotectonic units and comprehensive cooling process of the Himalaya since early to middle Miocene.

The ZFT ages of the LHS show northward younging linear distribution from the oldest age in the frontal zone (13.4 ± 1.0 Ma) to the youngest age in the root zone (1.5 ± 0.2 Ma). Partially reset ZFT ages (~450 Ma) from the autochthonous LHS indicate that the LHS has undergone inverted thermal metamorphism caused by hot metamorphic nappe. The LHS in west-central Nepal is not covered by metamorphic nappe, however, these partially reset ages indicate that northern part of the LHS was once covered by the metamorphic nappe, and at present it was eroded out.
On the other hand, the ZFT ages from the HHC and the TTS range from 10.9 ± 0.8 Ma to 1.7 ± 0.4 Ma, and show southward younging distribution. The ZFT ages of the HHC have positive correlation to elevation excepting old ages nearby major shear zones, indicating that cooling of the HHC occurred downward. The ZFT ages of the TTS have positive correlation to structural distance from the MCT and the STD. The ZFT ages from the TTS indicate that the TTS was cooled downward accompanied by exhumation of the HHC. The ZFT age distribution pattern along transect well corresponds to present uplift rate distribution, which suggests that the ZFT age distribution pattern reflects regional vertical velocity. Inter-seismic vertical velocity distribution is considered to be controlled by kinematics and geometry of the MHT which is the main active decollement, thus the ZFT age distribution pattern seems to reflect exhumation and cooling of the hangingwall of the MHT.