

# Uplift and denudation history of mountains and low-temperature thermochronology

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Thermochronology is a branch of geochronology, which can reconstruct thermal history of rock samples because the apparent ages get younger than the formation ages depending on the thermal history. By applying thermochronology to rocks formed in a high-temperature zone at a great depth, regional denudation history can be estimated. Low-temperature thermochronology, e.g., fission-track and (U-Th)/He dating methods, are especially useful to constrain denudation history at the upper crust shallower than several kilometers from the surface. Low-temperature thermochronology has been applied to various tectonic settings all over the world, such as continental collision zones, passive margins, shields, sedimentary basins, continental arcs, and island arcs (see also compilation of Herman et al., 2013, *Nature*) since the first application in the Swiss Alps (Wagner et al., 1977, *Mem. Instit. Geol. Mn. Univ. Padova*). Although low-temperature thermochronology is now amongst the most common approaches in tectonic geomorphological and structural geological studies, interpretations of thermochronometric data are often confusing especially for beginners and laypeople; for a successful interpretation, cooling, denudation, and uplift should be taken into accounts as well as geochronological and analytical discussions. This presentation primary aims to expand understanding of thermochronology to wider people, especially to beginners and laypeople. I will review the basic concepts and fundamental terminology in terms of thermochronometric applications to mountaneous regions. In addition, I am planning to introduce some case studies and thermochronometric mapping in the Japanese Islands.

Keywords: uplift, denudation, low-temperature thermochronology