Geophysical Research Abstracts
Vol. 21, EGU2019-7340, 2019
EGU General Assembly 2019

Garnet dating of Caledonian metamorphism in the Grampian Highlands and Shetland Islands, Scotland

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The Caledonian Orogenic belt spans the North Atlantic area and documents the lower Palaeozoic collision of the Laurentian and Baltican palaeocontinents as the Iapetus Ocean closed. The Scottish sector of the Caledonides formed part of the Laurentian pelaeocontinent and was affected by multiple episodes of metamorphism and deformation related to Caledonian orogenesis.

Garnet is a superb tool for understanding the processes and timings of metamorphism in orogenic belts, due to its pervasive nature, ability to preserve compositional records of metamorphic paths, and high parent-daughter ratio for two different geochronometers (Lu-Hf and Sm-Nd).

Here, we present Lu-Hf and Sm-Nd garnet ages from the Shetland Islands, northeast of Scotland; and Sm-Nd garnet ages from the Grampian Highlands in northern Scotland to provide insights into the timings, rates, and duration of metamorphism within this sector of the Caledonian orogenic belt.