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**From micro to macro: Microsampling Lu–Hf garnet geochronology**

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The conventional isochron method requires dissolution of bulk mineral separates and/or whole rock powders to construct an isochron from which a geological age may be determined. Recent advances in techniques for measuring small amounts of samples of Nd/Sr with mass spectrometry, together with our abilities in selective dissolution techniques, that highly elevate the parent/daughter ratios, has allowed the development of Sm–Nd and Rb–Sr garnet geochronology via a microsampling method, either using micro-saw or micro-drill facilities. However, the common presence of micro-zircon inclusions in garnet and the relatively large amount of materials that are needed for Hf isotope analysis have limited application of the microsampling method in the use of Lu–Hf garnet geochronology. Here, we use conventional a micro-sawing method to produce several sections from a single garnet porphyroblast of several centimetres in diameter, which yields enough material for Hf isotope analysis. The Lu–Hf dates vary more than a hundred of millions years for the micro-sawed sections from the porphyroblasts. With the observation of elemental zoning patterns in the garnet, the dates are interpreted to bracket the period of garnet growth, reflecting two episodes of garnet growth in high-pressure metamorphic events. These dates appear to suggest a tectonic model of yo-yo subduction cycles registered in a single garnet. Microsampling Lu–Hf garnet geochronology not only provides constraints on the timing of garnet growth at a microscale, but also provides insight into tectonic processes in a macroscale.

