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Unroofing a Trans-Crustal Magmatic System: Provenance and Magmatic Sources in the Cadomian Belt

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Large-scale evaluation of temporally protracted magmatic provinces is limited by the number of samples physically collected and analysed in a given time frame. Sedimentary cover sequences provide an avenue to collect expansive magmatic information spanning a large geographic area with a relatively small number of samples.

The Cadomian belt (Brittany, France) exposes a trans-crustal magmatic system, whose age is poorly constrained, and the overall magmatic source(s) are still debated. Trans-crustal magmatic systems exposed at different crustal levels represent a window to the crustal evolution processes, allowing to investigate magma generation, migration, and differentiation. To better understand the timing and nature of the Cadomian magmatism, as well as the pre-Cadomian basement ages, we collected samples of the post-Cadomian sedimentary cover sequence.

In this study, we present preliminary results from our investigations into the magmatic history and sources of the Cadomian belt using U-Pb geochronology coupled with Hf isotopes on detrital zircon of the Cambrian cover sequence. U-Pb and Hf data from 12 samples provide insights into the crustal provenance of the sediments, and then into the mantle and crustal contributions in the source of the different magmatic events spanning the Cadomian. These new data will provide better constraints on the exposed trans-crustal magmatic system, and contribute to refining the model of geodynamic evolution of the Cadomian.