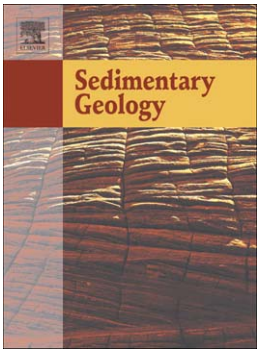

Continental growth seen through the sedimentary record

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Continental growth seen through the sedimentary record

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Abstract

Sedimentary rocks and detrital minerals sample large areas of the continental crust, and they are increasingly seen as a reliable archive for its global evolution. This study presents two approaches to model the growth of the continental crust through the sedimentary archive. The first builds on the variations in U-Pb, Hf and O isotopes in global databases of detrital zircons. We show that uncertainty in the Hf isotope composition of the mantle reservoir from which new crust separated, in the $^{176}Lu/^{177}Hf$ ratio of that new crust, and in the contribution in the databases of zircons that experienced ancient Pb loss(es), adds some uncertainty to the individual Hf model ages, but not to the overall shape of the calculated continental growth curves. The second approach is based on the variation of Nd isotopes in 645 worldwide fine-grained continental sedimentary rocks with different deposition ages, which requires a correction of the bias induced by preferential erosion of younger rocks through an erosion parameter referred to as *K*. This dimensionless parameter relates the proportions of younger to older source rocks in the sediment, to the proportions of younger to older source rocks present