Geophysical Research Abstracts,
Vol. 11, EGU2009-4657-1, 2009
EGU General Assembly 2009

Testing palaeotectonic models for the Internal Hellenides with sediment provenance

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The Internal Hellenides of Greece are a result of the Alpine–Himalayan orogen. The relationships between different pre-Alpine crustal fragments of the Internal Hellenides are now masked by younger (Mesozoic to Cenozoic) complex structural and metamorphic events. This, together with the scarcity of biostratigraphic, geochronological and palaeomagnetic data, has given rise to equivocal palaeotectonic models and interpretations.
However, the age and origin of pre-Alpine basement units in the Internal Hellenides has important implications for our in-depth understanding of the evolution of North Gondwana-derived terranes and consequently for alternative palaeotectonic reconstructions for the Palaeozoic and Mesozoic.
A multidisciplinary sediment provenance study was undertaken since sedimentary rocks can provide information about rock lithologies in the source area, which have often been destroyed and recycled during ancient plate tectonic processes. Palaeozoic and Mesozoic sedimentary rocks from key areas of the Internal Hellenides were analysed using whole-rock major- and trace-element geochemistry (XRF, ICPMS), detrital chrome spinel, garnet, white mica and rutile chemistry (EMP), detrital zircon geochronology (SHRIMP, LA-ICPMS) and biostratigraphic analysis. These new data are used to constrain terrane accretion processes and the provenance of crustal sources for sediments during Palaeozoic and Mesozoic times and thus will test palaeotectonic models for the Internal Hellenides. This is expected to shed light on the Palaeo- and Neotethyan evolution in the Eastern Mediterranean.