DIRECT DATING (U-Th) OF FAULT CEMENTS FROM THE CORINTH RIFT (GREECE)

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Investigation of fault mechanics in a very active tectonic area such the rift of Corinth requires among various proxies a precise and reliable chronology of fractures opening and an estimate of the fault activity duration. For instance, the hypothesis of a south-north migration of successive faults during the evolution of the southern margin of the rift has to be validated by an absolute chronology.

The material filling these fractures is sometimes made of pure carbonate, thus suitable for Th-U dating. Because U-series elements have strongly different physical properties and notably their solubility, U is present in natural waters where it makes various complexes with carbonate ions, while Th is absent because quite non soluble. At the crystallisation time of a pure carbonate, Th/U ratio is equal to zero. When measured by thermo-ionisation mass spectrometry (TIMS) this disequilibrium allows a reliable chronology up to 600 ka. Nevertheless, ages validity is dependent of some prerequisites: the geochemical U-Th system has to remain closed from the crystallisation time, and thorium has to be absent at crystallisation time. The second condition is demonstrated by the absence of ^{232}Th. When ^{232}Th is present, generally because of detrital material mixed with the carbonate, a correction for the ^{230}Th-excess has to be applied. The first condition is essentially due to U solubility. It is difficult to demonstrate that nor secondary addition nor leaching of uranium has occurred. The best criterion is the consistency of a few data for a few samples, *i. e.* homogeneous U contents and ^{234}U/^{238}U ratios for samples belonging to a same environment, equal ages for contemporaneous samples, regularly increasing/decreasing ages with stratigraphy.

It should be noticed that the material filling the fractures may be a breccia composed of old carbonates mixed with new carbonate cement. If these two materials cannot be totally separated, the age calculated from ^{230}Th/^{234}U ratio cannot represent the cement age and thus cannot post-date the fracture. First results obtained from the northern and southern margins of the Corinth rift are presented in order to evaluate the potential of this application.