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Refining the use of laser ablation ICP-MS U-Pb dating in the study of detrital zircon populations: spatial resolution and Neogene zircons.

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As we enter an era of mass production of U-Pb data applied to the study of detrital zircon populations it is perhaps not untimely to be reminded that U-Pb dating always happens at the individual scale. Every analysis is unique and must be judged on its own merit. This aspect is of paramount importance in the application of U-Pb dating to the study of detrital zircon populations, since there is no consanguinity among the analysed individuals, as opposed to igneous or metamorphic zircons.

It is also important to be fully aware that what we call a *date* or an *age* is in the offspring of a marriage between two very different and imperfectly known worlds: The natural and the analytical.

Minerals amenable to U-Pb dating have many isotopic, chemical and structural complexities that we are far from fully understanding. The analytical world, regardless of the technique of choice (ID-TIMS, Ion Probe, LA-ICP-MS), has limitations and complexities related to the still poorly understood phenomena that take place during mass spectrometry and/or beam-sample interaction.

Geochronology is an ever evolving conglomerate of sciences that aims at continuously furthering our understanding of both worlds and their interaction in order to increase the availability, reliability and precision of geochronologic information demanded by

earth science researchers.

Because our understanding of Earth evolution depends heavily on our ability to measure the *time* and *tempo* of geological events, geochronology is always meeting new technological and methodological challenges.

In this presentation, two current challenges to the Laser Ablation ICP-MS U-Pb dating technique will be presented: (a) Spatial resolution and its current limitations, (b) Can we obtain reliable age information from very young (Neogene) zircons by means of this technique?

The first issue will be presented using data obtained on zircons from lower crustal granulite xenoliths from the Spanish Central System and the second issue will show research in progress on U-Pb dating of zircon from a variety of igneous rocks whose ages range from *ca*. 28 to 0.7 Ma.

These two aspects will be commented upon in view of their potential to: (a) be useful in refining the information encoded in detrital zircon populations as the analysis of small CL domains in zircon offers a deeper insight into the “history” of individual grains, and (b) expand the study to detrital zircon populations to very young sedimentary rocks and sediments in a variety of present-day environments.