



## MAGM-1: Arcos magmáticos fanerozoicos

### Robust U-Pb SHRIMP zircon ages of granitic plutons of the Cordillera Real of Bolivia: Thermal evolution and geological implications

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The Real Cordillera of Bolivia is a mountain belt located at the core of the Eastern Cordillera of the Central Andes, with a length of 250 km along strike, 40 km wide and containing summits with more than 6000 meters above the sea level. It was the locus of important felsic magmatism occurred in two pulses. The first pulse took place during the Triassic, at the northern segment, with the intrusion of the Huato, Illampu, Yani, Huayna Potosí, Zongo and Taquesi plutons within Paleozoic metasedimentary country rocks. An extensional regimen is interpreted as a widespread continental rifting, associated with the breakup of the Pangea Supercontinent and to a magmatic input from the upper mantle. Long after that, at the southern segment, during the Upper Oligocene, the emplacement of the Illimani, Quimsa Cruz and Santa Vera Cruz plutons characterizes the second pulse. These younger magmas are considered to have been formed within the continental crust, in association with an overall compressional regimen and mafic input from the asthenospheric upper mantle. Fifteen U/Pb SHRIMP zircon ages demonstrate the crystallization of the plutons of the first pulse between 224 to 240 Ma and the second pulse at about 26 Ma. Inherited zircon xenocrysts are frequent in all of these plutons, preserved by the low temperatures of melts estimated by zircon saturation temperatures. Paleozoic to Neo-Proterozoic sources predominate, but Proterozoic sources are also present. The available K/Ar and Ar-Ar apparent ages in micas, published much earlier, were used to estimate the cooling rate for the Triassic plutons, as well as their more recent thermal history. For most of the plutons, these apparent ages are moderately younger than the U-Pb SHRIMP zircon ages. However, in the case of the Zongo pluton, and possibly for the Yani deformed batholith, a very important thermal event took place during the mid-Eocene, at about 39 Ma, interpreted as the regional cooling through Ar closure temperature of muscovite. The apparent K/Ar ages, many of them much younger than 190 Ma, in addition to disturbed Ar-Ar spectra, are indicative of important partial argon loss. This thermal event also perturbed the U/Pb isotopic systems of that area. Because of that, the zircons of the Zongo pluton, which exhibit very high U concentrations (up to 20000 ppm), display systematically an anomalous reverse discordance in the Concordia diagram. This enrichment might be related to local U redistribution.