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Late Devonian anatectic magmatism in the North Patagonian foreland: mechanisms and regional implications

Oral Presentations

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E-Posters

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The Pacific margin of South America represents an excellent example of crustal growth, since accretional and collisional events occurred throughout late Neoproterozoic and Phanerozoic times, involving various deformation and magmatic events, and thus different crustal differentiation mechanisms^{1,2,3,4,5,6}. In particular, an understanding of the timing and P-T conditions of crustal anatexis related to crustal thickening events is crucial to constrain proposed geotectonic models.

Our study area is located in the North Patagonian foreland and forms part of a Middle to Late Paleozoic igneous-metamorphic belt of several hundreds of kilometers long^{7,8}. Migmatites are widely distributed and are commonly related to medium- and high-grade metamorphic rocks. However, the migmatization event(s) are still not well characterized.

Our new U-Pb zircon data from syntectonic granitoids (Taquetren Range, Central Patagonia) indicate a ~360Ma crystallization age. These granitoids have a peraluminous character and are part of a migmatized metapelite sequence. Metamorphic ages (using monazites) range from 390-330 Ma. Our data place the crustal melting process into the Late Devonian, a time of protracted high-grade metamorphism in this region. Our P-T- determinations (e.g., using MAD) yield 7.5 to 8.5 Kbar and 710-750°C. Additional information comes from stable isotope data and detrital zircon studies, the latter showing main peaks of Meso- to Neoproterozoic, late Cambrian-early Ordovician, Silurian, and late Devonian times.

We will discuss the possible implications for the geotectonic evolution of the area, given that, for mid-late Paleozoic times, several geodynamic models have been strongly debated^{9,10,11}.

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