

TRACE ELEMENT CONTENTS AND U-Pb GEOCHRONOLOGY OF DETRITAL ZIRCONS FROM THE SÃO ROQUE DOMAIN: IMPLICATIONS FOR PROVENANCE AND THE EVOLUTION OF PRECAMBRIAN CRUST IN SOUTHERN BRAZIL

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Textural and trace-element analysis and U-Pb geochronology of detrital zircon of quartzites from meta-volcanosedimentary sequences of the São Roque Domain were combined to infer provenance and help understand the tectonic evolution of the Precambrian crust in the Mantiqueira Province, southeast Brazil. A significant proportion of the zircon crystals show rounded cores with growth zoning truncated and overgrown by a thin rim that is dark in CL images. The trace element signatures indicate that most of the rounded cores are derived from plagioclase-rich felsic rocks (tonalite, granodiorite). Only a small proportion of the detrital zircons derived from mafic (gabbroid) sources, as indicated by some compositional peculiarities (strong positive Ce anomaly, high Lu_N/Sm_N ratios, low U/Yb, and a concave-down shape of the intermediate REE in chondrite-normalized plots). The overgrowths are chemically distinct from the cores, being enriched in major and trace elements, especially the LREE, and were dated at 584 ± 47 Ma, reflecting the regional Neoproterozoic metamorphism. The age spectra of detrital zircons from five samples of quartzite from the São Roque Domain show a wide range (1.4-3.4 Ga), with a prominent peak at ~ 2.2 Ga, and other main peaks at 2.4-2.5 and 2.7-2.9 Ga. The samples from Pico do Jaraguá and Serra do Japi record the largest contribution from old sources (>3.1 Ga) whereas younger sources (1.8-2.0 Ga) contributed more to the Serra do Pirucaia and Serra do Voturuna samples. Since the zircon compositions indicate the predominance of granitic sources, the consistent age peak at ~ 2.2 Ga suggests a major period of crustal growth in the sources at this time. The youngest detrital crystals, although subordinate, place a minimum limit for the depositional age of the São Roque metasedimentary sequences at ~ 1.8 -1.7 Ga, which is consistent with U-Pb dating of interlayered metavolcanic rocks. [Financing: Fapesp, 12/04148-0]