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The igneous plumbing system of the Early Permian Bolzano/Bozen supervolcano (North-eastern Italy)

Andrea Boscaini[1], Joshua H.F.L. Davies[2], Raffaele Sassi[1], Claudio Mazzoli[1], Sara Callegaro[3], Angelo De Min[4], and Andrea Marzoli[5]

[1]Dipartimento di Geoscienze, Università di Padova, 35131 Padova, Italy (andrea.boscaini@phd.unipd.it)
[2]Département des sciences de la Terre et de l'atmosphère, Université du Québec à Montréal, H2X 3Y7 Montréal, Québec, Canada
[3]Centre for Earth Evolution and Dynamics, University of Oslo, 0371 Oslo, Norway
[4]Dipartimento di Matematica e Geoscienze, Università di Trieste, 34127 Trieste, Italy
[5]Dipartimento Territorio e Sistemi Agro-Forestali, Università di Padova, 35020 Legnaro, Italy

Early Permian Post-Variscan magmatism is widespread throughout the Alps and consists mainly of felsic to mafic plutonic and volcanic bodies emplaced between ca. 285 and 275 Ma. This study focuses on the acidic to intermediate intrusions in the areas of Trento and Bolzano/Bozen (North-eastern Italy) like the Cima d'Asta gabbrodiorite/granite, the Pergine granodiorite, the Monte Sabion and the Bressanone (Brixen) granites. New U-Pb zircon data along with ages for the Ivigna (Ifinger) and Monte Croce (Kreuzberg) granites and the Bressanone (Brixen) gabbro constrain the age of the Permian intrusions and Hf isotopic data highlight the interaction between mantle-derived melts and crustal rocks during ascent of the former through the crust. Moreover, the studied intrusions represent the shallow crustal plumbing system of the coeval widespread volcanics of the Athesian Volcanic Group and the mega-caldera of the Bolzano/Bozen supervolcano. This acid intrusive-extrusive magmatism, which identified an elliptic structure of more than 4200 square kilometers, represents the biggest magmatic event outcropping in the Southern Alps and likely influenced the ecosystems of the Athesian Volcanic District and of the dolomitic area l.s. during the Permian.