

The core of the Lepontine dome: new geological, structural, metamorphic and geochronological data (sheet Osogna, no. 1293,1:25'000)

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The central part of the Lepontine dome includes, from bottom-to-top, the subpenninic gneissic nappes of the Leventina, Simano, Adula/Cima-Lunga and Maggia. These nappes derive from the same post-Variscan gneissic crust complicating their lithological distinction within the nappe pile. We present the geological map of the Osogna sheet (Swiss National Map no. 1293,1:25'000) together with structural and metamorphic data and magmatic and metamorphic U-Pb zircon ages of ortho- and paragneisses laying along the Leventina-Simano boundary. The geological map shows lithological boundaries that are locally incongruent with the tectonic contact of the published maps. In particular, the boundary between the Leventina and the Simano gneisses is not clear. Generally, the boundary was traced within leucogneisses by joining a carbonate lens with quartzite, amphibolite or paragneiss lenses. Nevertheless, we could not find any quartzite and the amphibolite and paragneiss lenses are vertically distributed in the tectonostratigraphy and do not form a single folded horizon. Within these two units the strain related to top-to-the-foreland shearing is rather distributed. Such deformation occurred at peak metamorphic conditions between 570 and 620 °C and below ~6000 bar (conditions constrained with equilibrium thermodynamics). Magmatic Early Permian U-Pb zircon ages from a folded granitic dike discordant within the paragneisses that separate the Leventina and the Simano units attest moderate deformation along the boundary during the Alpine orogen. Therefore, we present evidence that the top-to-the-foreland deformation between the Leventina and the Simano units was more distributed than commonly assumed, limiting the allochthonous character of the Simano unit.