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3D cartography of the Alpine Arc

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We present a 3D cartography of the alpine arc, a highly non-cylindrical mountain belt, built using the 3D GeoModeller of the BRGM (French geological survey). The model allows to handle the large-scale 3D structure of seventeen major crustal units of the belt (from the lower crust to the sedimentary cover nappes), and two main discontinuities (the Insubric line and the Crustal Penninic Front). It provides a unique document to better understand their structural relationships and to produce new sections. The study area comprises the western alpine arc, from the Jura to the Northwest, up to the Bergell granite intrusion and the Lepontine Dome to the East, and is limited to the South by the Ligurian basin. The model is limited vertically 10 km above sea level at the top, and the moho interface at the bottom. We discarded the structural relationships between the Alps sensus stricto and the surrounding geodynamic systems such as the Rhine graben or the connection with the Apennines. The 3D-model is based on the global integration of various data such as the DEM of the Alps, the moho isobaths, the simplified geological and tectonic maps of the belt, the crustal cross-sections ECORS-CROP and NFP-20, and complementary cross-sections specifically built to precise local complexities. The database has first been integrated in a GIS-project to prepare their implementation in the GeoModeller, by homogenizing the different spatial referencing systems. The global model is finally interpolated from all these data, using the potential field method. The final document is a new tri-dimentional cartography that would be used as input for further alpine studies.