

**location**

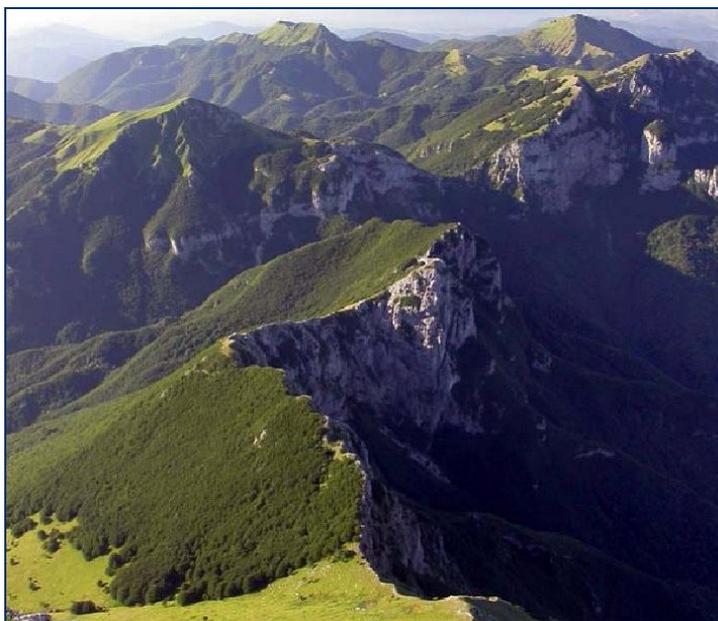
region	Tuscany
province	Lucca-Massa Carrara
municipality	various
sector	North-western Tuscany
toponym/locality	Apuan Alps

**interest**

scientific interest	structural geology geo-history
contextual interest	landscape, historical botanical, faunal, etc.
interest evaluation	representative
level of interest	international

**conservation status**

characteristic/condition	good
risk of natural deterioration	non-existent
risk of anthropogenic deterioration	medium

**geological and environmental description**

The inner part of the Apuan Alps is characterized by a large tectonic window with the shape of an irregular ellipsis. It is a typical geological structure formed by the erosion of the thrust system, which exposes the deepest structural units of the Northern Apennines made of a metamorphic complex originated during the Alpine orogeny. The Apuan tectonic window is one of the best examples of direct overlapping of high-crustal tectonic units over a metamorphic complex deeply deformed at mid-crustal level. Consequently, the Apuan Alps are a key to the interpretation of the Northern Apennines' tectonic evolution during the Cenozoic. The rocks of the tectonic window belong to the Metamorphic Sequence of the Tuscan Domain, generally divided into: a) the Massa Unit (Paleozoic and Triassic formations) outcropping in the south western edge of the massif; b) the Autochthon *Auct.* (Hercynian Basement and Mesozoic-Tertiary Alpine Cover), located in the central and north-eastern sectors of the tectonic window and including the deepest part of the Metamorphic Complex. Allegedly, the deformation structures of the tectonic window were formed by two main tectonic-metamorphic regional events – phases 'D1' and 'D2' – which took place 27-20 Ma and 14-11 Ma, respectively. The first ductile compressional deformation (D1) was caused by the continental collision between the Corsica-Sardinia plate and the Adria microplate (Paleogene). The basement and the cover of the metamorphic complex are deformed and metamorphosed (greenschist±biotite±cyanite facies) in a NE-verging ensialic shear belt and are overlapped by the Tuscan Nappe and the Ligurian Units *s.l.* The ductile extensional deformation phase (D2) leads to the gradual isostatic re-equilibration of the thickened crust by tectonic denudation and erosion (Neogene). The latest stages of the Apuan Alps deformation are linked to the development of brittle structures associated with vertical movements locally exceeding 4 km.

**description of the level of interest**

The Apuan tectonic window was already pinpointed by proGEO (1996) as an important element of the European geological heritage, as it is a peculiar geological structure at international level in the field of Earth Sciences. Since the origin of modern geology the Apuan Alps have always been a key area to study and understand complex geodynamic processes leading to the formation of the Apennines range. This territory is a large structural geosite of European importance, not least owing to its historical contribution to the development of geological knowledge.