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The pattern of the tectonic joints and the development of the Vlychada karst show cave in Diros, Peloponnesus, Greece

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The most characteristic feature of carbonate rocks is that they are prone to dissolution due to the meteoric water circulation which is enriched in CO₂. One of the factors influencing this phenomenon is the existence of discontinuities within the mass of carbonate rocks. The Diros Vlychada show cave, on the peninsula of Mani in Peloponnese, Greece, has developed in marbles that belong to the Plattenkalk geotectonic unit. Most of the cave is flooded with water and its level changes depending on the external weather conditions and variations in sea level. The deformation of the marbles is represented by tectonic structures formed during the Lower Miocene metamorphism and their subsequent exhumation. The final uplift stage took place during the Pliocene-Quaternary and is still active. Five joints systems were distinguished:

A NW-SE joint system which is subdivided into a subsystem with low-angle dips, mainly towards to the NW, related to the main foliation of the marbles and a second subsystem characterized by stretching joints of the same strike (elongated joints), which have high-angle dips, also towards the NW. The latter system intersects the former but is confined between marble bedding and does not extend to more than three beds (the bedding is defined by the first subsystem).

A NW-SE striking joint system characterized by stretching joints with high-angle dips, which intersects diagonally the two previous. This system extends between more than three marble beds.

Two systems show E-W and N-S strike with the first one much better expressed. Those joints have developed diagonally to the previous ones. These are mainly shear joints that intersect the first system and are propagated within many marble beds.

The chambers of the cave have been developed along NW-SE and E-W directions. The first one is identified with the joint system that has been developed transversely to the strike of the marble foliation and the second in parallel with the main system of the shear joints. It is interesting that the bays forming the coastline of the Mani peninsula, have developed in an E-W direction, which coincides with both one of the growth directions of the cave and one of the joints systems, which correspond to shear joints developed during the folding of the marbles. Stalactites and stalagmites grow in a NE-SW direction that is identical to the elongated joints which form the

system that is parallel to the foliation strike. Groundwater flow along these branches may be slower as these branches appear to be restricted between marble bedding.