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Evidence of recent activity in the Camorro Fault (Central Betics, Southern Spain)

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The Camorro Fault is located at the foot of the northern slope of a limestone karstic massif that is called 'Sierra de Las Chimeneas', in the central sector of the Betic Cordillera (Southern Spain). The fault shows a well-marked surface expression. It is a 6 km-length strike-slip with extensional component fault that forms part of the Torcal Shear Zone. This fault can be continued 7 km eastward along the foot of northern slope of the 'Torcal de Antequera' (Málaga), World Heritage Site since 2016. The Camorro fault plane is well-exposed in some sectors while in others, the fault plane has been either affected by karstification processes or partially covered by talus deposits.

One of the most characteristic geomorphological features of the 'Sierra de Las Chimeneas' area is an impressive rock avalanche deposit, covering an area of 2.2 km^2 and for which we estimated a volume of 0.48 Hm^3. Given the characteristics of the rock avalanche deposit, we consider that it could be triggered by an earthquake on the Camorro Fault. This hypothesis is supported by other investigations that have already referred to quaternary paleoseismicity in this area. Previous archaeological research revealed a period of human occupation in a cave ('Cueva del Toro') located in the 'Torcal de Antequera' that point out evidences about the occurrence of a cataclysm in the late Copper Age (about 5000 years ago). Other studies have also suggested a possible connection between seismic events and megalith-building near Antequera. Beyond this, an archaeoseismic analysis in the megalithic site of Antequera (also World Heritage Site since 2016) found deformation structures probably linked to oscillations between the megalith orthostats during an earthquake. According to all of mentioned research, the Camorro Fault could be a good candidate to account for such prehistoric earthquake.

Further geochronological work remains to be done, specially focused on dating (e.g. by cosmogenic isotopes) the fault scarp of the Camorro Fault and the associated rock avalanche deposits. If cosmogenic and archaeological dates coincide, we could attribute all the mentioned observations to an earthquake of severe magnitude in an area where the population ignore that hazard. Thus, we could contribute not only to the history of human occupation of the World Heritage Site but also providing insights into the earthquake recurrence and seismic hazard of the region.