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Karst geomorphology and hydrology at the Campania – Basilicata border (southern Apennines of Italy)

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This paper describes the main karst geomorphological and hydrological features of the area at the boundary between the Campania and Basilicata regions, in the southern Apennines of Italy. Even not far from the most important karst area of southern Italy (the Alburni Massif, hosting hundreds of caves, with very complex subterranean systems that have been extensively explored in the last 50 years), this sector has never been object of detailed karstic studies. Geologically, it shows a carbonate bedrock consisting of Cretaceous limestones and dolomites, in tectonic contact with terrigenous deposits of Miocene age. The territory is an active seismogenic zone, as testified by the November 23, 1980, earthquake that hit this part of southern Italy with a 6.8 magnitude, causing over 2,700 victims and destroying several small towns in the two regions.
In 2007, within the framework of joint projects between the Italian Speleological Society (SSI) and the Cuban Speleological Society (SEC), a scientific and speleological expedition was carried out in a sector of this area. The efforts produced during the expedition, and in the preceeding phases as well, resulted in discovery, survey and documentation of 62 caves, and in supporting the progresses of the exploration activities in the main karst system in the area, a complex of two caves that reach a maximum depth of 123 meters and an overall length of 1,8 km.
At the surface, a variety of karst landforms is recognizable. The main carbonate ridges show several orders of palaeosurfaces, located at different heights above sea level. Bounded by fault lines or fault line scarps, they present variable extension, the highest surfaces showing a much better continuity. On the Campanian side, several sinkholes are also present, some of which opened in the aftermath of the 1980 earthquake. The same event caused in Basilicata the formation of several caves of structural origin, controlled in their development by tectonics and extremely unstable, due to high disruption of the rock mass. Maximum depth observed in this type of caves is 25-30 meters.