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### **Geoarchaeological investigation of the Middle to Upper Paleolithic anthropogenic features in Fumane Cave (Italy)**

*Keywords: micromorphology; combustion features; Middle Paleolithic; Upper Paleolithic; living space*

Monti Lessini, in the northeast of Italy, is considered a key region for the investigation of the behavior of hunter-gatherer groups. The region contains several archaeological sites that contribute to the reconstruction of the archaeological record during the Late Pleistocene. Fumane Cave is one of the richer deposits in the area, with 12m of stratified deposits. The study presented here provides a diachronic analysis of anthropogenic features from Fumane Cave, using a range of geoarchaeological tools (i.e. micromorphology, FTIR analysis, and micro-XRF) in order to better understand human actions and their interaction within the living space. The results include evidence for direct and indirect features, combustion features, human reworking, spatial organization, long term vs short term events, and post-depositional processes, thereby providing a broad view of occupational strategies employed by the site's inhabitants. The analysis provides new data on the arrangement and maintenance of the living space inside the cave and demonstrates the potential of microcontextual techniques for understanding traces of human activity within an archaeological site.

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### **Site-forming processes and age of the Mid-Upper Palaeolithic sequence at Uluzzo C Rock Shelter (Apulia, Southern Italy)**

*Keywords: cave sediments; micromorphology; optically stimulated luminescence; Uluzzo C; Italy*

The demise of Neanderthals and the dispersal of *Homo sapiens* in Eurasia is a hot topic in archaeological and anthropological research. In Italy, such transition is related to the Uluzzian technocomplex, which also corresponds to the first archaeological evidence for *H. sapiens* along the European continent. The Uluzzo C Rock Shelter in southern Italy is one of the key sites to explore this event. Fresh geoarchaeological investigation at the site allowed to reconstruct the timing and the main depositional and post-depositional processes in charge of the formation of the archaeological record. Optically Stimulated Luminescence (OSL) ages from Uluzzo C Rock Shelter provides a terminus post quem for the end of the Mousterian in the region, constraining the disappearance of the Neanderthals in that part of Italy to  $\geq 46 \pm 4$  ka. Moreover, our OSL chronology confirms the onset for the Uluzzian in

the area to ~39.2–42.0 ka; this age is congruent with radiocarbon dating results and tephrochronology from neighbouring archaeological sites. Sedimentological analyses and thin section micromorphology suggest that a range of depositional processes occurred between MIS4–2. Most sediments are related to the dismantling of the vault of the rock shelter and wind input of loess deflated by the continental shelf that was subaerial exposed during glacial times. The occasional reactivation of the hydrology of the local karst system under more humid conditions further contributed to the formation of specific layers consisting of accumulations of former Terra Rossa-type soil fragments. Superposed to sedimentary processes, several post-depositional processes modified the deposits; among them, strong bioturbation and the mobilization and recrystallization of calcite. Excavation at Uluzzo C Rock Shelter has been founded by the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 724046 – SUCCESS; <http://www.erc-success.eu/>).