FIRST FINDS OF PALAEOSEISMOLOGICAL DEFORMATIONS ON SPELEOTHEMS IN BULGARIA (LEPENITSA CAVE, SOUTH BULGARIA)

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Lepenitsa Cave is situated in the West Rhodopes Mountains. It is formed in fractured Proterozoic marbles. The region is one of the most seismically active in Bulgaria. The maximum observed intensity is I=7 MSC-64. For return period of 10000 years the maximum expected intensity is evaluated to I=9 MSK-64. This fact let us to consider that some of the anomalous developed and broken speleothems found in the cave are the results of strong seismic events. The speleothems affected could be divided into the following groups: (1) cracked stalactones, considered as a result of slow aseismic deformations; (2) broken, but still vertical stalactones - the surfaces of ruptures show features as of brittle fracturing, and they could be considered as a result of short and strong shock; (3) broken and inclined stalagmites and stalactones usually covered by new calcite depositions up to 10-20cm - this can be considered as an evidence that they have been rapidly broken in relatively constant conditions of sedimentation; (4) breakdowns (plates) fallen from the ceiling, often nearly upright with old stalactites which directions indicate the initial breakdown orientation; new vertical stalagmites growth on the breakdowns mark the moment of falling. An eventual dating of these different speleothem generations could give us a valuable information about the evolution of the seismic activity in the region and dating of the strongest recent earthquakes as well as information about the Quaternary geodynamics of the region.