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Large array of inselbergs and continuation of sub-Cambrian peneplain in the Baltic Basin based on interpretation of seismic data, Western Lithuania

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The sub-Cambrian peneplain is a well-known geological phenomenon in Scandinavia and it is found in sub-aerial outcrops in Finland, Sweden, and Norway. It is suggested that the peneplain formed within the Baltic Sea region in Cryogenian and Ediacaran / early Cambrian, when Baltica, a part of Rodinia at most of that time, experienced a tectonic stability, strong sheet-wash weathering and glaciations. While the peneplain outcrops at the surface in the Baltic Shield region, the remaining part of this peneplain is buried under the Phanerozoic sediments that comprise the Baltic Basin. This buried part of sub-Cambrian peneplain is known to have several inselbergs that occur as isolated ones or as sparse groups of inselbergs. From the results of interpretation of 2D and 3D onshore seismic data newly acquired in Western Lithuania, the continuation of sub-Cambrian peneplain was identified in Western Lithuania, a large array of inselbergs was mapped to the detail that the 3D seismic can permit, and the change in paleo-topography character of the Precambrian basement from flat to hilly and rough, was observed. The flat western side of our study area is interpreted as a continuation of the sub-Cambrian peneplain, which outcrops sub-aerially in Scandinavia while to the southeast it is buried under the strata of Baltic Basin. The southeastern part of our study area has many closely spaced hill-like features of various size, it is of considerable extent (at least 30 km) and does not comply with the peneplain's definition on a local scale. It is interpreted as a part of large array of inselbergs. Though some of the largest palaeo-topography features in the study area were documented before, only the detailed mapping revealed that in Western Lithuania there is a large and dense array of inselbergs. This array of inselbergs is exceptional because it is the largest and densest of all known clusters of inselbergs in the Baltic Basin.