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Monitoring the on-going incision and uplift in a forested hilly environment at the Danube Bend, Hungary - A conceptual approach

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The Danube Bend is a unique tectono-geomorphic area in the Pannonian Basin. The course of the Danube is a spectacular view as well as a separating line of two Miocene volcanic edifices, the Börzsöny and the Visegrád Hills. The river Danube has formed several strath terraces in the Quaternary, their existence together with the results of repeated precise levelling, prove the high uplift rate of the area. However, in situ cosmogenic nuclide analyses have shown that the Danube Bend itself is approximately 200 ka old. Consequently the tributaries situated in the Börzsöny and Visegrád Hills are affected by continuous base level lowering, that leads to incision.
This on-going incision produced spectacular gorges in the volcanic material. Since the area is largely forested, dendrogeomorphic methods can be applied to determine the gully head retreat, incision rates and material evacuation. On the other hand, the geomorphic mapping and the high accuracy determination of geomorphic surface is rather difficult because of the steep slopes and dense vegetation.
To facilitate the analysis Airborne Laser Scanning measurement campaign is planned in order to (a) get a high-accuracy DTM (b) determine the slope distribution for surface processes modelling (c) map microtopographic features that may outline other tectonic lineaments.
A further by-product of the measurement campaign will be the mapping of archaeological features, among them Medieval fortification lines, that are today hardly visible and can be mixed up with geomorphic features.
Combining the aforementioned instrumental measurement techniques in an integrative approach, the surface evolution of the area can be revealed with unprecedented accuracy and geographic coverage.