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Pleistocene alteration of drainage network and diverse surface morphology forced by basement structure in the foreland of the Eastern Alps

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Transition zones between uplifting and subsiding units are usually represent composite morphology, which evolution often alters the shape of the drainage system. The study area situated around Kőszeg–Rechnitz Mountains and Vas Hill/Eisenberg (the easternmost parts of the Eastern-Alps), that are the parts of the Rechnitz Penninic Window. These metamorphic units are surrounded Miocene sediments of different thickness. The description of the geology of the area need to be complemented with different age Pleistocene gravel terraces that mostly situated on several levels along the recently insignificant Strem stream.

The morphology of the western part of the study are show blocks with gently undulating surface, tilting southward or southeastward. These blocks are usually bordered by steep scarps originated from tectonic forces and/or fluvial erosion. The western part is situated above the eastern one with approximately 50 m dissected by a steep scarp, lengthen along the trench of Pinka valley. Due to the more significant fluvial erosion caused by this higher level, borders of the blocks are difficult to set out. Our previous investigation using swath analysis resulted in a simplified model of the study area, consists of uplifting/subsiding units, tilted blocks, erosion trenches and steep scarps. The origin of these blocks and scarps has partly also revealed: in some cases continuous tilting has been detected. Abstract titled Pleistocene alterations of drainage network between the Alps and the Pannonian Basin show detailed results of the investigations about the origin of these blocks.

The aims of this paper are to strengthen the tectonic origin of the mentioned scarps coupled to the basement structure and relief, as well as to the Miocene deeper structure provided by marker layers of lignite. This paper also provide some implications about drainage network changes using the recognized modification effects of the scarps.

Many of surface structure lines could be coupled to basement faults, for instance in case of the eastern and western margin of South Burgenland Swell as well. In other cases, surface structure lines show link to steep slopes in basement relief, for instance in case of the continuation of Vas Hill/Eisenberg and the scarps situated along Strem stream. Strikingly, one of the seemingly most obvious scarps (Németújvár/Güssing scarp) does not show any correlation with the basement structure. Due to the surface lineaments coupled to the basement slope changes, we have to consider the low detailed basement survey, but the effects of different scaled compaction caused by the different thickness of Miocene sediments are also notable.

The considered faults altered the drainage network during the Pleistocene sedimentation, forming recent terrace system and composite surface structure of the study area. The investigation was supported by Hungarian Scientific Research Fund (OTKA NK83400).