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## **Remote sensing of Carpathian flysch landslides**

### **Abstract**

Terrestrial laser scanning helps us to detect unstable subsurface behaviour, assessing the slope stability and potential landslide failure modes. If the slopes are regularly observed, the risk of slope movement and subsequent consequences may be considerably reduced. This allows for optimum land use conditions that are economically justified. Landslides in the Carpathian flysch have a peculiar susceptibility to activation due to the region's geological structure. This work addresses the problem of monitoring and analysing the effects of landslides associated with the operation of routes (roads and railway lines) running through the slopes that comprise the Carpathian flysch.

The terrestrial laser scanner enables site remote sensing in a simple and automated manner. Regular measurements with multiple scanner positions may be used for long term slope monitoring. A detailed geological structural model allows for risk assessment with regards to failure modes, and it allows for a slope stability assessment. The model, along with the substrate parameters, introduced into the Finite Element Analysis package enables an analysis of the effects of landslide susceptibility and the displacements of the terrain surface in time, as well as due to different loading cases.