



UAV-based photogrammetry combination of the elevational outcrop and digital surface models: an example of Sanyi active fault in western Taiwan

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An unmanned aerial vehicle (UAV) with a digital camera is an efficient tool for geologists to investigate structure patterns in the field. By setting ground control points (GCPs), UAV-based photogrammetry provides high-quality and quantitative results such as a digital surface model (DSM) and orthomosaic and elevational images. We combine the elevational outcrop 3D model and a digital surface model together to analyze the structural characteristics of Sanyi active fault in Houli-Fengyuan area, western Taiwan. Furthermore, we collect resistivity survey profiles and drilling core data in the Fengyuan District in order to build the subsurface fault geometry. The ground sample distance (GSD) of an elevational outcrop 3D model is 3.64 cm/pixel in this study. Our preliminary result shows that 5 fault branches are distributed 500 meters wide on the elevational outcrop and the width of Sanyi fault zone is likely much great than this value. Together with our field observations, we propose a structural evolution model to demonstrate how the 5 fault branches developed. The resistivity survey profiles show that Holocene gravel was disturbed by the Sanyi fault in Fengyuan area.