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DEM and GIS based topographic profile analyses of Danxia landforms

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"Danxia Landform" is a special geomorphological type put forward by Chinese geologists, formed and developed in China. Danxia landforms consist of red terrestrial clastic rocks, and are characterized by red cliff scarps. In China, Danxia landforms have been studied for about 80 years. In recent years, the landforms have also been receiving international attention. However, morphometric studies of Danxia landforms have been very limited. Topographic profiles including stream longitudinal profiles are geomorphological components that characterize the landscape of dissected mountains and hills including Danxia landforms. This study employs DEMs (Digital Elevation Models), GIS and computer programming techniques to acquire a series of topographic profiles of Danxia landforms including stream longitudinal profiles at a catchment scale, and performs quantitative analysis of geomorphic indices coupled with some mathematical models for trunk streams and tributaries. Special attention is paid to slope-area relationships. The results provide one of the first quantitative evaluations of Danxia landforms.

Keywords: Danxia Landform, DEM, longitudinal profile