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Extraction of Lineaments and Fractures of Khorramabad form the Images of LANDSAT 8 and ASTER Sensors Using Manual and Automatically Digital Methods

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Abstract:

One of the applications of remote sensing in geology is mapping of lineaments, which is considered as one of the most important issues in geological studies in different areas. The purpose of this research is extraction of the lineaments of Khorramabad watershed from LANDSAT 8 and ASTER sensors images using manual and automatically digital methods. The detection techniques including filtering and spatial principle component analysis were applied on the images. For the extraction of lineaments from the images as manually and automatically digital methods were applied. The lineaments extracted by automatically digital method were compared with the faults on the regional geological map. They were then validated using Google earth and finally lineament map and Rose diagram was prepared. The Rose diagram shows Northwest-Southeast and Northeast-Southwest trends and Northwest-Southeast is the one prevailing in the area. Lineament density map shows the highest density of lineaments in West, Southwest, and Northeast areas. The lowest amount of density was observed in central parts of the study area. After checking the extracted lineaments, the results showed that lineaments extracted by automated methods were less accurate than ones extracted by manual methods regarding compatibility with the faults on the geological maps. The automatically digital method, because of its low accuracy is not recommended for geological studies, since this kind of study deals with methods which have high accuracy. As a result, the best method for geological and structural studies in large areas and areas with difficult access is the extraction of lineaments using visual and manual digital methods.

Keywords: Extraction of lineaments, LANDSAT 8, ASTER , the manual method, the automated method