

عنوان مقاله:

Radiometric and Geometric Correction Methods for Active Radar and SAR Imageries

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نویسندگان:

Mansourpour - Dept. of Geomatics Eng., University of Tehran, Tehran, Iran

Rajabi - Dept. of Geomatics Eng., University of Tehran, Tehran, Iran

Rezaee - National Cartographic Centre (NCC), Tehran, Iran

خلاصه مقاله:

Radar imagery has become one of the most important data sources and efficient tools for terrain analysis and natural resource surveys since 1960s. With the development of technology in the field of radar remote sensing, new generation of radar sensors, i.e., Synthetic Aperture Radar (SAR) was born. Unique specifications of radar systems and images versus optical ones led to a whole new series of applications for radar imageries all over the world. However, the level of achievable accuracy from radar imageries is still a problem for their applications. Multiplicative noise such as speckle which is unavoidable part of coherent radar images, degrade radiometric quality and interpretability. Moreover, geometric distortions such as foreshortening, layover, shadow and other problems related to special imaging geometry of radar systems, decrease reliability of radar imageries. Thus, radiometric and geometric corrections and calibrations must be applied to the radar images before using them. This paper uses four filters with different window sizes to remove/reduce the speckle noise. These filters are Lee, Lee-Sigma, Gamma- MAP and Frost. It is shown that Gamma-MAP filter has a better performance than the other three filters, if the ratio of Mean/Std is used as a criterion. Moreover, geometric correction is done using three different methods including polynomial with five control points, geocoding with ephemeris, and orthorectification using ephemeris, DTM and control points. The results show that the last method which is called radargrammetric is more successful in removing the effects of foreshortening and layover. Besides, the accuracy of geometric correction using radargrammetry is better than the other two methods too.

کلمات کلیدی:

SAR Images, Speckle Noise, Filter, Foreshortening, Layover, Shadow, Orthorectification

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