山区星载ALOS PALSAR微波遥感图像的正射校正

Orthographic calibration of space-borne ALOS PALSAR microwave remote sensing image in mountain area

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中文摘要：

　　多山地区微波遥感图像的正射校正是实践应用中的关键和瓶颈，该文以星载合成孔径雷达数据ALOS(advanced land observation satellite) PALSAR为基础数据，GAMMA软件为处理平台，研究微波图像正射校正方法。首先利用数字高程模型 (digital elevation model，DEM)及卫星轨道参数生成模拟合成孔径雷达数据（synthetic aperture radar，SAR），再利用图像交叉相关分析算法自动搜索模拟SAR与真实SAR同名地物点偏移量，建立校正多项式模型，在此基础上通过建立校正查找表方法实现真实SAR图像的地理编码及正射校正。校正效果经检验，误差在一个像元以内，校正效果较好。

英文摘要：

　　the ortho-rectification of SAR (synthetic aperture radar) is difficult and a key step for its final application especially in mountain area. However, the method of the ortho-rectification of SAR is not available in the current remote sensing software. In this paper, the ortho-rectification of microwave remote sensing image was conducted based on GAMMA software platform and ALOS PALSAR basic data. Firstly, the simulated SAR image was generated by means of DEM (digital elevation model) and the satellite orbit parameter. Then, the registration offsets between the simulated SAR image and the real values were determined automatically using cross correlation analysis, and the polynomial models of these offsets were built accordingly. Finally, the true SAR image was resampled from the SAR with range and azimuth coordinates to one with the orthonormal map coordinates using a lookup table, which was generated by comparing the simulated and real SAR image and refined by the offsets registration polynomials. The accuracy of registration was tested by comparing with topographic map, and rectification errors were less than one pixel, which is less than 20 m.

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