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基于MODIS与AMSR-E数据的新疆雪情参数协同反演

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Title: Co-inversion of snow parameters in Xinjiang based on MODIS and AMSR-E data

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关键词: [协同反演](#); [MODIS](#); [AMSR-E](#); [雪盖](#); [积雪深度](#)

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摘要: 准确及时地掌握雪情参数及其动态变化是雪灾监测与灾情评价的基础。提出了一套基于MODIS与AMSR-E遥感传感器数据的雪情参数快速提取方案。利用MODIS反射率数据与AMSR-E亮温数据,反演了新疆2010年1月初的积雪范围与积雪深度。结果表明:利用MODIS与AMSR-E数据的协同反演策略能够有效去除云层对积雪识别的影响,弥补因云层造成的地表信息缺失;同时保持较高的空间分辨率,提高雪情参数的识别精度。根据同期气象站的观测数据,对协同反演的雪情参数精度进行了评价:总体识别精度达到88.7%,积雪识别精度达到80.5%,在10-30 cm雪深范围内,遥感反演的精度较高,但在雪深小于10 cm或大于30 cm的局部地区存在较大的偏差。提出的MODIS与AMSR-E遥感数据的协同反演方案简单可行,可以实现逐日全天候的雪情快速监测,为雪灾监测与评价提供重要的基础数据。

Abstract: Accurate and timely extraction of snow parameters is the base for the monitoring and assessment of snow disasters. This study presents a co-inversion scheme for the rapid extraction of snow parameters in Xinjiang based on the MODIS and AMSR-E data. The snow coverage and snow depth of early January, 2010 of Xinjiang area were estimated using the daily Terra and Aqua MODIS surface reflectance and AMSR-E brightness temperature data. Results show that, the integrated use of the MODIS and AMSR-E data in the inversion of snow parameters can effectively remove the impact of clouds on the detection of snow distribution, and give better estimation and identification of ground snow information with higher spatial resolution. The observational data of the metrological stations of Xinjiang were used to evaluate the accuracy of the extraction of snow parameters, which indicated that the overall accuracy is

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88.7% and the snow identification accuracy is 80.5%. The proposed approach has higher degree of precision in the estimation for snow with depth range of 10-30 cm, while outside of this depth range (thicker than 30 cm or thinner than 10cm) the estimated snow depth from the MODIS and AMSR-E data is relatively rough. The study also proved that the co-inversion strategy based on the MODIS and AMSR-E data is easy to implement and effective in all-weather conditions estimation of daily snow parameters, which may provide useful information for monitoring and assessing the snow disasters in Xinjiang.

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