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6S辐射校正与像元分解结合提高苹果树花期冠层反射率反演精度

Improving retrieval accuracy of apple tree canopy reflectance at blossom stage by combining 6S radiometric correction with pixel unmixing method

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中文关键词：遥感,反射率,像元,辐射校正,混合像元分解,TM影像,6S模型,苹果树花期冠层

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中文摘要:

为了获取近似真实的苹果树冠层反射率，该文以山东省栖霞市为研究区，应用DEM数据和6S辐射传输模型，对苹果树花期TM影像进行辐射校正、混合像元分解，获取26个果园苹果树冠层反演反射率，将反演结果与相同时段地面实测冠层反射率以及表观反射率、表观—像元分解反射率进行比较，分析了反演效果及精度。结果表明，地表反演反射率有效减弱了地形和大气的影响，恢复了阴影处的地物，影像清晰度明显提高；苹果树冠层反演反射率样本平均值误差较表观、表观—像元分解、地表反演3类反射率小，与实测值的相关系数提高，而且样本间变化趋势与实测值基本一致。此反演方法具有一定可行性，对于苹果树冠层反射率和苹果园管理基础数据获取与应用具有积极意义，也可为其他农业遥感反演研究及应用提供借鉴。

英文摘要:

In order to obtain approximate true reflectance of apple tree canopy, taking Qixia City in Shandong province as the study area, the ground surface reflectance was retrieved from TM image through radiometric correction based on DEM and atmospheric parameters from 6S Model. And the reflectance of apple tree canopy at blossom stage in 26 sample orchards was further retrieved using pixel unmixing method. Then the retrieval accuracy was assessed by the comparison of retrieval reflectance with measured canopy reflectance at the same time, apparent reflectance, and apparent-unmixing reflectance of 26 samples. The results showed that this method could weaken the effects caused by atmosphere and topography effectively, recover the ground objects in the shadow of the hills. So the analytical ability of ground surface retrieval reflectance images was improved obviously. Errors between canopy retrieval reflectance and measured value were the least of the four types of reflectance, while correlation coefficient between them was the highest. Moreover, the display features of canopy retrieval reflectance among samples were more similar to measured reflectance than that of the other types. It could be concluded that this retrieval method was feasible, so this study will be served as a reliable reference to obtain the base data for the apple tree management, and other similar agriculture retrieval research.

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