

刘振华,赵英时.基于遗传算法的不同光照条件下植被和土壤组分温度反演[J].农业工程学报,2012,28(1):161-166

基于遗传算法的不同光照条件下植被和土壤组分温度反演

**Retrieval of plant and soil component temperature under different light conditions based on genetic algorithm**

投稿时间: 2010-12-19 最后修改时间: 2011-10-17

中文关键词: [遥感](#), [遗传算法](#), [土壤](#), [组分温度](#), [直方图](#)

英文关键词: [remote sensing](#) [genetic algorithms](#) [soil](#) [component temperature](#) [histogram](#)

基金项目:国家重点基础研究发展规划项目(2007CB714407)

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中文摘要:

为了提高地表土壤组分温度的反演精度, 该研究利用ASTER反射光谱数据获取像元组分比, 将直方图法引入遗传算法中, 从而缩小了获取遗传算法最佳搜索参数的范围, 并利用遗传算法对盈科研究区内地表非同温像元进行组分温度分解, 对非同温像元下植被、遮阴土壤、光照裸土的组分温度进行模拟。该研究采用遗传算法直接对ASTER热红外数据进行地表混合像元组分温度分解的方法验证。结果表明, 在考虑反射波段情况下, 模拟的组分温度与地表同步实测温度的相对误差为7.63%~8.867%, 在不考虑反射波段情况下, 模拟的组分温度与地表同步实测温度的相对误差为8.955%~11.832%, 表明了此方法在研究地表组分温度反演是可行性。该研究为地表组分温度反演提供新思路。

英文摘要:

In order to improve component temperature retrieval precision, the component ratio of pixel was acquired by reflectance spectrum data of ASTER(advanced spaceborne thermal emission and reflection radiometer). Because the histogram method was introduced to the genetic algorithm, the optical ranges of parameters research were reduced. And the improved genetic algorithm was used to retrieve three component temperatures: vegetation, sunlit soil and shade soil temperature in the YingKe study area and three temperatures were simulated. To provide a good test data, the retrieval of component temperatures by genetic algorithm under condition of only considering thermal radiation was validated. The results showed that comparing simultaneous field data, the error range of simulated temperature under condition of considering thermal radiation and reflectance data was 0.763%-8.867%, and the error range of simulated temperature under condition of only considering thermal radiation was 8.955%-11.832%, the study results show that the new method is feasible and provide a new way of thinking for retrieval of land surface component temperature.

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