冬小麦冠层表面温度裂窗算法的筛选与土壤含水率监测

Selecting split-window algorithm for retrieving canopy surface temperature of winter wheat and monitoring soil water content

投稿时间：2004-12-29　　最后修改时间：2006-8-14

稿件编号：20061104

中文关键词：裂窗算法； 冠层表面温度； 土壤水； 冬小麦

英文关键词：split-window algorithm; canopy surface temperature; soil water content; winter wheat

基金项目：国家863课题(2003AA209030)；国家自然科学基金(30270776)和(40501029)；荷兰SAIL基金会的中荷合作项目“可持续土地管理(SULAMA)”(SAIL-SPP 299.399)资助

作者	单位
刘云	(1971-)，女，新疆库尔勒人，博士，主要从事农业遥感及土地可持续利用方面的研究。北京北京农学院园林系，102206。Email:liuyun_bj@tom.com
宇振荣	中国农业大学资源与环境学院，北京 100094
孙丹峰	中国农业大学资源与环境学院，北京 100094
侯世全	中国农业大学资源与环境学院，北京 100094

中文摘要：

NOAA气象卫星的两个热红外通道可以用来反演地球表面温度，而地球表面温度可用于监测土壤含水率。该研究于2002年冬小麦主要生育期，应用9种裂窗算法反演了邯郸地区的地表温度，并用这一时期冬小麦地面观测的冠层表面温度进行验证，结果表明：9种方法中，UL92法比较适合邯郸平原区地表温度的反演，平均误差为-0.27℃，标准误差为2.66℃；并建议：对于山区和丘陵地带，如能使裂窗算法结合数字高程模型(DEM)，也能使山区和丘陵地带的地表温度反演精度提高，最后以地面试验基础上所建立的冬小麦地表温度与土壤含水率间的回归拟合经验方程为基础，用UL92法反演的地表温度监测不同土层的土壤含水率，这是一种利用热红外遥感监测区域剖面土壤含水率的新方法的尝试，证明地面基础试验所建立的经验方程与遥感数据结合能监测区域土壤剖面的土壤含水率。

英文摘要：

Two thermal channels of NOAA can be used to retrieve land surface temperature, which can be used to monitor soil water content. Nine kinds of split-window algorithms were used to retrieve surface temperature of Handan during the winter wheat growing stage in 2002, and the results were validated by ground experiment. It indicates that UL92 method is the best one for land surface temperature retrieval in plain area of Handan with less average error and standard error. For the mountainous areas and highland, if digital elevation model was combined, split-window algorithm could retrieve land surface temperature more precisely. Based on the field experiment, functions between surface temperature of winter wheat and soil water content were established. The functions can be used along with UL92 method to monitor soil water content of different soil layers. That was a new method of using thermal remote sensing to monitor regional sectional soil water content. It was concluded that regional sectional water soil content can be monitored by combining the experiment function with remote sensing data.

查看全文　　关闭　　下载PDF阅读器

服务热线：010－65929451 传真：010－65929451 邮编：100026 Email：tcsae@tcsae.org