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沙尘灾害遥感监测方法研究与比较(PDF)

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Title: Study and comparisonof methods for sand dust disaster remote sensing monitoring

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摘要: 在研究和分析沙尘灾害遥感监测原理的基础上,针对沙尘灾害遥感监测工作的需要,给出了2种沙尘信息提取方法(分层提取法和热红外窗区法)和3种沙尘灾害强度监测方法(密度分割法、变化矢量分析法和可比沙尘强度指数法),并对各种方法的应用效果分别进行了分析、验证和比较。结果表明:(1)沙尘信息提取方法中,热红外窗区法较分层提取法物理意义明显,稳定性低较高,步骤简单,更适合于业务化实现。(2)沙尘强度监测方法中,密度分割法相对简单,能定性描述沙尘灾害强弱分布;变化矢量分析法虽是一种较好的监测方法,但对数据要求苛刻;可比沙尘强度指数法可用于多源遥感数据动态监测应用,是较为理想的沙尘强度监测方法。(3)综合利用遥感和地面监测数据是沙尘灾害强度监测亟待解决的重点和难点之一;同时,解决多种卫星数据监测结果的一致性和可比性,是实现卫星协同使用、提高沙尘灾害监测时间分辨率的必经途径。

Abstract: Based on the study of the theory of sand dust disaster remote sensing monitoring, two information extraction methods and three intensity monitoring methods of dust storm disaster were given according to the need of the task of sand dust disaster monitoring.The two sand dust information extraction methods are layered extraction method and thermal infrared window channel method.The three sand dust intensity monitoring methods are intensity separation method, change vector analysis method and comparable sand dust intensity index

method.The application effect of thosem ethods was analyzed, verified and compared.The results were concluded as the following: (1) Among the sand dust information extraction methods, thermal infrared window channel method is more stable, simple, suitable for operational realization with more obvious physical meaning compared with the layered extraction method.(2) Among the in tensity monitoring methods, in tensity separation method is a comparatively simple method and could describe the intensity distribution qualitatively.change vector analysis method is a good m on itoring method, but the request for the data is rigorous.comparable sand intensity index method could be used for dynamic monitoring based on multi-resource remote sensing data, which is the comparatively ideal method for sand dust intensity monitoring.(3) How to use remote sensing data and ground monitoring data synthetically is one of the important and difficult problem for sand dust intensity monitoring.At the same time, to realize the monitoring result to be coherence and consistency is the key problem for cooperative using different satellites and improving the temporal resolution of sand dust disaster monitoring.

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