

论文

月球表面遥感图像阴影消除及其信息恢复研究

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摘要:

由于月球表面的地形起伏引起月面遥感图像像素与太阳相对位置和几何取向不一致, 导致月面遥感数字图像上阴影像素的产生。为了解决这一问题, 利用与遥感图像匹配的DEM和光照方位参数进行遥感图像的阴影判断, 基于DEM数据, 利用邻坡反射辐射, 进行自然地形条件下的月表遥感图像阴影像素的阴影消除, 恢复成太阳光谱照度相等(入射角, 反射角和距离相同)时的像素遥感值。仿真实验结果表明: 该方法较好地消除了月表影像的阴影, 充分恢复了月表影像的反射/光谱特征。

关键词: 月球表面;遥感图像;阴影消除;邻坡反射

Shadow removal and information recovery for remote sensing images of lunar surface

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Abstract:

Since the undulate topography of the lunar surface leads to the variance of the lunar surface remote sensing image pixels with the sun relative location and geometry orientation, the shadow pixels of the lunar surface remote sensing digital images are produced. In order to solve the problem, the judgment of the shadow on remote sensing images was implemented by utilizing DEM matching with the remote sensing images and the parameters of illumination orientation. A method for shadow removal of lunar remote sensing images taken under the condition of the natural topography was developed using adjacent reflective radiation based on DEM data. The shadow pixels' remote sensing value can be rectified to the horizontal remote sensing value with same solar direct radiation. The simulation experiment result shows that the method can eliminate the shadow of lunar surface images and can thoroughly recover the reflection/spectrum characteristics of lunar surface images.

Keywords: lunar surface; remote sensing image; shadow removal; adjacent reflected radiation

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