微分光谱遥感及其在水稻农学参数测定上的应用研究

Derivative Spectrum Remote Sensing and Its Application in Measurement of Rice Agronomic Parameters of Rice

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中文摘要：

通过不同氮素营养水平的水稻田间试验,解析了水稻冠层微分光谱对消除背景(湿土、水面)信息的影响,证实微分光谱在消除背景信息的影响方面起到了很好的作用。用微分光谱确定出最优的波段宽度应小于10nm;将微分光谱应用于农学参数测定,存在红边位移现象,在孕穗期之前,红边随施氮量增加向长波方向移动“红移”;孕穗期之后“红移”现象基本消失,而发生“蓝移”。红边参数(红边、红边振幅、红边振幅与最小振幅的比值、红边峰值面积)与上层叶片的叶绿素含量、LAI有着密切的关系,而与叶片中的叶绿素b、类胡萝卜素之间相关性不明显。一些红边参数可作为水稻叶绿素含量、LAI测定的简捷方法。从而证实了利用微分光谱测定一些农学参数的可行性

英文摘要：

The objective of this paper is to analyze the elimination of background signals(such as wet soil, water and so on) using derivative canopy spectra of rice under different nitrogen status. Application of this technique for tackling analo gous problems such as interference from soil background reflectance in remote sensing is proposed. Potential areas for th e application of this technique in remote sensing are considered. The optimum spectral bandwidth for smoothing is less th an 10 nm. When the derivatives are applied to determine the agronomic parameters, there is a shift phenomenon of the red edge. The red edge positions move to longer wave bands till booting stage and move to shorter bands after booting stage w ith nitrogen increasing. The red edge parameters in the first derivative reflectance curve (wavelength, amplitude and are a of the red edge peak) were studied to evaluate rice leaf chlorophyll, LAI. A high correlation was found between chlorop hyll A content of top leaves and the wavelength of the red edge position and between LAI and the red edge parameter. The n, the red edge was proved to be valuable for assessment of rice upper leaves chlorophyll contents. But a correlation was not found between chlorophyll B content of leaves or carotenoid and the wavelength of the red parameters. Some red edge p arameters are one of the best remote sensing descriptors. The feasibility of using derivative spectra to measure some agr onomic parameters is verified.

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