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地面观测方案

青海云杉林叶面积指数半球摄影测量方法研究

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摘要：

在介绍原理的基础上，首先分析了相机曝光对高质量鱼眼照片获取的影响，提出了一种野外操作可行的最佳曝光参数设置方法：将曝光量相对林下自动曝光量调低两步，即固定光圈，把快门速度相对林下自动曝光速度调快两步。随后分析了鱼眼照片3个波段对天空—树叶分类乃至孔隙率和LAI计算的影响，提出了鱼眼照片处理的基本流程，该流程主要要求选择蓝波段图像进行分析和利用0~60°天顶角范围内的图像参与LAI计算。通过对青海云杉林LAI多仪器同步观测实验对比证明：用提出的曝光方法和数据处理流程得到的LAI与LAI 2000测值基本相当，具有很好的应用前景。

关键词： 叶面积指数;LAI;半球摄影;鱼眼镜头;曝光;青海云杉

Leaf Area Index Estimation for Qinghai Spruce Forest Using Digital Hemispherical Photography

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Abstract:

After the fundamental basics of leaf area index measurement by optical instrument and digital hemispherical photography were introduced, the impact of the camera exposures was analyzed for high quality fish eye photo acquisition. We proposed a new method for camera settings. The optimum exposure would be two stops less exposure than the referenced exposure, which is measured by automatic exposure with the stands. This setting could be achieved by fixing the aperture and tuning the shuttle speed. The three bands of the photo were also compared to select the best one for sky foliage segmentation. A digital photo processing procedure was proposed including selecting the blue band and using the area covering the 0~60° zenith angles for LAI calculation. Consistence was achieved between our results and those from LAI 2000 thanks to the multi equipment comparison experiments on LAI measurement of Qinghai spruce.

Keywords: Leaf area index Hemispherical photography Fish eye lens Exposure Qinghai spruce.

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