

基于激光反射的土壤表面粗糙度测量装置设计与试验 Design of a Laser Scanner for Characterizing Soil Surface Roughness

蔡祥 孙宇瑞 林剑辉 Schulze Lammers P

中国农业大学

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摘要: 为了实时获取土壤表面粗糙度数据, 设计了一种基于激光三角测距原理的土壤表面粗糙度专用测量装置。采用激光扫描测距仪测量微位移, 其精度高、响应速度快, 测距分辨力高达0.1mm, 显著提高了土壤表面粗糙度的测量精度; 借助于光电编码盘和螺杆组合实现高精度扫描定位; PDA作为上位机, 农田环境下具有方便携带, 大容量存储数据和智能化实时处理功能等优点。Soil surface roughness has been widely used for characterizing soil surface profile. To rapidly measure soil surface roughness in situ, a laser scanner is developed based on triangulation principle. Compared with traditional instruments, this device has higher measurement resolution (0.1mm), precision positioning ability (1mm), and efficiency. A PDA (personal digital assistant) is used as data-logger, which can meet the requirements of portability, large data memory, and real-time data processing in field.

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