

机载式农田三维地形测量系统设计与试验 Tractor-mounted Field 3-D Topography Surveying System

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摘要: 设计了一种机载式农田三维地形测量系统。该系统主要由激光测量接收器、GPS接收机、控制器和液压系统等组成,除了可以进行地形测量外,系统还可以实现激光平地作业。其测量原理是利用测量接收器获取测量点的高程信息,利用GPS接收机获取测量点的平面位置信息,将两者在控制器中进行数据融合,从而得到测量点的三维地形信息。在田间试验条件下,对机载式农田三维地形测量系统进行了不同行进速度下的试验研究,并与采用定点测量方法获取的数据进行了比较。试验结果表明,该系统在低速行驶条件下与定点测量方法具有较好的一致性。In order to obtain the topographic information efficiently, a tractor-mounted field 3-D topography surveying system was developed. The surveying system consisted of a measuring laser receiver, a GPS receiver, an intelligent controller and a hydraulic system. Furthermore the system could also conduct laser land leveling. The measuring laser receiver was used to obtain the elevation, and the GPS receiver was employed to obtain the longitude and latitude data. Both of them were fused in the controller so as to get the 3-D topographic information. The field experiments were carried out in different moving speeds and then the data measured by the surveying system were compared with the data from the fixed-point surveying method. The results show that the surveying system has a good consistency with the fixed-point surveying method in lower moving speed.

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