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论文

高分辨多波束海底地形探测的MSB-RMU算法研究

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Research on MSB-RMU Algorithm on High Resolution Multibeam Detection of Seafloor Bathymetry

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摘要 常规多波束测深系统中采用的FT波束形成技术不能完成外侧波束区域海底地形的高精度估计，而采用相位检测法的相干多波束测深系统在此区域能得到高精度和高分辨地形估计。基于此，该文提出MSB-RMU算法，此算法结合FT波束形成技术和相位检测法的优势，具有较高的空间分辨率，能够同时实现中央波束区域和外侧波束区域的高精度地形估计。对试验数据的处理结果表明此方法的有效性、实用性与优越性。此算法保证了国内首台多波束测深系统能够达到6倍水深以上的覆盖扇面。

关键词： 信号处理 多波束 海底地形测量 宽覆盖 高分辨率

Abstract： Traditional multibeam bathymetry system based on FT beamforming method can not achieve high accuracy seafloor bathymetry estimation of outer beams area, while interferometric multibeam bathymetry system based on phase detection method can estimate the bathymetry information in such area with high accuracy and resolution ability. To improve the performances of traditional multibeam bathymetry system, MSB-RMU algorithm is proposed, combining the advantages of FT beamforming and phase detection methods, which has high spatial resolution ability and achieves high accuracy bathymetry estimation of both central beams area and outer beams area. The processing results of experiment data prove the efficiency, practicality and superiority of the new algorithm, which ensures the first domestic multibeam bathymetry system to achieve 6 times coverage of the water depth.

Keywords： Signal processing Multibeam Seafloor bathymetry Wide coverage High resolution

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