

地磁匹配用于水下载体导航的初步分析

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摘要 随着地磁场模型的日趋完善和滤波技术的不断成熟, 地磁匹配方法在近几年得到迅速发展, 它一般用于近地卫星, 还未用于海洋环境. 针对这一问题, 本文结合地磁场特点和海洋地磁测量的现状, 分析了水下地磁匹配的可行性. 分别从匹配的地磁模型和测量值中存在干扰磁场两方面, 指出了制约该技术发展的几个因素. 在此基础上, 提出了地磁用于水下载体定位的两条技术途径, 一是用小波变换滤去地磁异常, 与大尺度地磁模型匹配定位; 另外, 也提出了利用地磁异常, 结合同时定位与构图 (SLAM) 算法实现自主导航.

关键词 [地磁场](#), [水下载体](#), [导航](#), [匹配](#)

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Preliminary analysis on the application of geomagnetic field matching in underwater vehicle navigation

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Abstract The methods of geomagnetic matching have progressed rapidly with the ripeness of earth magnetic field model and the development of filter technology, they usually used in near earth satellite orbit navigation and have never mentioned in ocean. The characteristics of geomagnetic field and the present situation of ocean geomagnetism matching have been connected to analyze the feasibility of submarine geomagnetism matching. Several factors which restrict the development of this technology have been pointed out, including the error of magnetic field model and the interference of background magnetic field. In this foundation, two ways have been proposed to settle the problem, one was based on wavelet transform which filter out the magnetic anomaly to match with the normal magnetic model, the other was based on the algorithm of SLAM (Simultaneous Localization And Mapping) which use magnetic anomaly to realize autonomous navigation.

Key words [geomagnetic field](#) [underwater vehicle](#) [navigation](#) [matching](#)

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