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基于浮力调节的大负载UUV载荷投放运动分析

Kinematic analysis on load release of UUV with large load based on buoyancy regulation

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英文关键词:UUV load release separation mathematical model pitch oscillation pitch adjusting

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中文摘要:

研究大负载UUV载荷安全投放技术,不可避免地要分析其载荷投放扰动特性。基于重力解脱方式,建立了载荷投放分离数学模型,通过浮力调节水舱比例-微分的深度控制,仿真UUV载荷投放受扰运动特性。仿真结果表明,载荷投放将导致UUV产生较大幅度纵倾振荡,海流会进一步加大纵倾振荡幅度,对UUV姿态稳定及后续投放产生不利影响。为此,提出了一种调节布局方案,并对其进行了可行性仿真验证。结果表明,该方案可有效地抑制纵倾振荡,提高了纵倾稳定性。

英文摘要:

To study load security release technology UUV with large load,it is necessary to analyze the disturbance characteristics of the load release.The separ mathematical model of load release by way of gravity is established.Under the PD depth control of the buoyancy adjusting water tanks,the movement characteri of UUV disturbed by load release is simulated.The simulation results show that,load release can lead to the large pitch oscillation that ocean current will further increase,which is bad for the attitude stability and next load release.So a kind of pitch adjusting layout scheme is proposed,the feasibility of whi verified through simulation.The simulation results show that the scheme can restrain the pitch oscillation and improve the pitching stability.

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