

一类轴对称充液陀螺系统自旋运动稳定性研究

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摘要 研究了一类复杂充液旋转对称陀螺(其圆柱形容腔充有互不相溶的双元液体, 且带充液圆柱中心杆)的章动振荡与其所充双元液体自由振荡之耦合问题. 利用留数方法研究了系统的自旋稳态运动的稳定性条件

关键词 [充液陀螺](#) [留数](#) [章动时间常数](#)

分类号

ON THE STABILITY OF A SPINNING, ROTATIONALLY SYMMETRIC TOP CONTAINING LIQUIDS

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Abstract

The problem of coupling between the nutational oscillation of a gyro containing three component liquids and the natural oscillation of the rotating liquids themselves is investigated. The interfacial tension is considered in the free surface bounding the liquids. The linearized equations are treated analytically using the Stewartson's and Zhukovsky's theory. The stability of motion is investigated using the method of residues. It is shown theoretically that instability can occur when any of the perio...

Key words [top containing liquids](#) [residues](#) [the nutation time constant](#)

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