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基于动压剖面的再入弹道解析解(PDF)

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Title: An Analytic Solution of Reentry Trajectory Based on Dynamic Pressure Planning

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摘要: 针对升力体飞行器滑翔再入的飞行特点，提出基于动压剖面的再入弹道解析方法。首先，推导基于动 压和高度历程的质点动力学方程，并给出已知动压剖面求弹道的解析算法。其次，根据飞行任务把滑翔再入 过程分成初始下滑段和准平衡滑翔段，通过动压规划设计准平衡滑翔段弹道。最后仿真表明基于动压剖面的 弹道设计方法能满足滑翔再入的飞行任务和飞行约束。

Abstract: An analytic trajectory solution based on dynamic pressure p lanning is presented for the gliding reentry of lift - body. Firstly, the equations of motion are transformed from velocity to dynamic pressure and from time to altitude. An analytic method is proposed to calculate the trajectory parameters on condition of the dynamic pressure. Secondly, ac - cording to flight task the gliding reentry is divided by initial d escent and equilibrium glide. The dynamic pressure of e - quilibrium glide is scheduled and the geometric trajectory is given . Lastly, the simulation result shows that the trajecto - ry design method is well satisfied the requirement of gliding reen try.

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