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反导制导滤波技术研究(PDF)

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Title: The Study on Filter Technologies of Anti missile Guidance

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关键词: 4态滤波; Weave导引; 最优控制

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摘要: 为了实现对下落段速度大、螺旋机动的弹道导弹的有效拦截，反导导弹必须有针对性的进行制导滤波技术的研究。文中创新性的采用拉普拉斯变换方法进行4态滤波设计，对目标加速度、加速度一阶导、加速度二阶导同时进行在线估计，滤波结果与3态滤波结果比具有延迟小、精度高的特点；同时结合已有Weave制导律，通过和3态滤波+比例导引、3态滤波+最优导引进行对比，得出4态滤波+Weave导引具有脱靶量小的优点。

Abstract: For effective interception of ballistic missiles with large velocity and screw maneuverability in their falling course, focused research should be carried out on guidance filter techniques. In this paper, a novel Laplace transform was used to design a four state filter and the target acceleration, first and second derivatives of acceleration were estimated. The results are more accurate with short latency compared with three state filter estimation. Meantime, combined with the given Weave guidance law, the four state filter with weave guidance law is proved to have advantages in smaller miss distance compared with the three state filter with proportional guidance law and three state filter with optimal guidance law.

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