反舰导弹航路规划与威胁规避算法

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摘要　　为减小武器系统的作战反应时间，提高任务规划系统的信息处理速度，从便于工程实现的角度出发，采用一种从目标位置向舰艇本身位置逆推的思想，应用平面解析几何的相关知识，提出了一种航路规划递推算法。该算法秉承导弹按预定方向攻击目标所需导航点最少的原则，在一定的假设条件下，从目标点开始，按照攻击方向的反方向依次逆推直至发射点，从而求得参考航路。在此航路上进一步考虑存在威胁的情况，按照修正后的航路走切线的思想，根据航路最短且调整航路次数最少的原则，提出了一种最短切线威胁规避算法，该算法通过添加导航点或者调整导航点，将不安全航路调整到威胁区域的最短切线上，以此来实现威胁规避，仿真结果验证了算法的正确性和有效性。

关键词　飞行器控制、导航技术　任务规划　航路规划　威胁规避　递推算法　切线

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Route planning and threat avoidance algorithm for anti ship missile

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Abstract In order to reduce response time of weapon systems and increase speed of information processing in mission planning system, a recursive route planning algorithm in the point of view of engineering application and on the idea of back reasoning from target position to warship position iteself was presented. Under some given condition, on the rule of the least number of navigation points which could complete the desired attack angle aviation, this algorithm can deduce next navigation point from target to the launcher in adverse direction of attack angle and get the planning route. Based on the planned route and in consideration of threats existed in the battle area, a tangetial route planning algorithm was proposed. According to the shortest planned route rule and the least number of adjusting planned routes, and by adding new navigation point or modifying old navigation point, this algorithm can adjust the planned old route to the shortest tangent of the threat area to avoid enemy. Simulation results show the validity and efectriveness of the proposed algorithms.

Key words control and navigation technology of aerocraft　mission planning　rout planning　threat avoidance　recursive algorithm　tangent

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