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最佳过失速机动研究

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RESEARCH ON OPTIMAL POST STALL MANEUVERS

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摘要

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摘要 分航迹变向和机头指向目标两类问题对飞机过失速机动进行数值优化研究。结果表明,为获得大转弯率应在最大升力迎角区贴近角点速度飞行,因减速较快需用大油门。经典的转弯率图能够反映这类航迹机动的特点。而机头指向目标机动的前段仍是航迹变向问题,到适当位置后再利用超大迎角机动能力指向目标。飞行仿真表明,飞机具有过失速操纵力矩和良好的飞控系统时大部分最佳机动可顺利实施,但若有极低速度要求则仍可能超出操纵极限

关键词: 航迹变向 机头指向 优化 过失速 实施

Abstract: Post stall maneuvers were optimized with a mission coverage of flight path reorientation and target pointing. Numerical practice has shown that for a rapid flight path reorientation the flight should be at the maximal lift angles of attack and close to the corner velocity while the maximum throttle setting be favorable due to the large deceleration, which is clearly illustrated by turn rate plots too. On the other hand, the first segment of a rapid target pointing requires a rapid flight path reorientation, and then in a proper position super high angles of attack are employed for pointing. Flight simulations give the operational process of the maneuvers by aircraft with control services and a flight control system suited for the post stall regime. Maneuvering at an extremely low speed, however, could exceed the controllability of the even control-enhanced aircraft.

Keywords: flight path reorientation target pointing optimization post stall operation

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