

Research on fast switching interception of the real target

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1、Introduction

In order to distinguish the decoy missile from the real in the middle of the ballistic missile flight, we proposed using image recognition and sliding-mode guidance in the kinetic energy interceptor terminal guidance phase. The paper set background on the kinetic energy interceptor in the middle course of ballistic missile flight. Due to the influence of the dummy target, the preset interception point is out of alignment and interceptors require terminal guidance adjustment. In this paper, two different global fast Terminal sliding modes are used to establish the intercept model equation. By simulink simulation comparison, it is found that the sliding mode guidance proposed in this paper can quickly and effectively switch interception orbit to hit the target

2、Simulation result

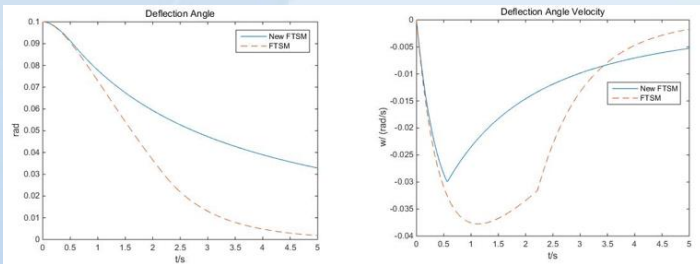


Figure 1 Deflection Angle comparison in 1000ms

Figure 2 Deflection Angle Velocity comparison in 1000ms

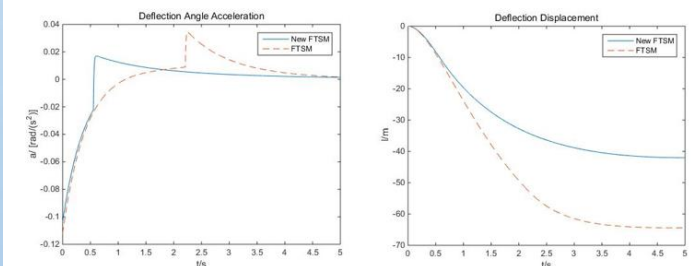


Figure 3 Deflection Angle Acceleration comparison in 1000ms

Figure 4 Deflection Displacement comparison in 1000ms

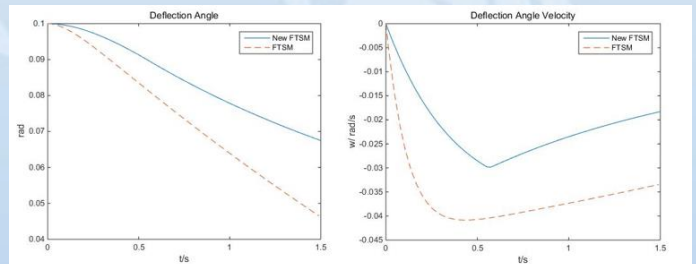


Figure 5 Deflection Angle comparison in 300ms

Figure 6 Deflection Angle Velocity comparison in 300ms

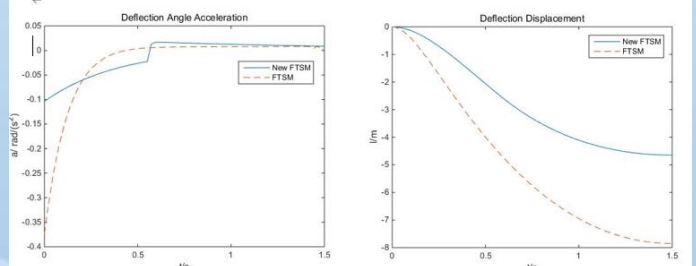


Figure 7 Deflection Angle Acceleration comparison in 300ms

Figure 8 Deflection Displacement comparison in 300ms

3、conclusion

1、The two sliding-mode guidance laws proposed in this paper can effectively solve the problem of short interception time and high precision in the process of switching between real and false warheads. This shows that the sliding-mode guidance law has a large scope in identifying and tracking the terminal guidance of the real warhead.

2、When the terminal guidance time is sufficient, the advantage of FTSM is greater. Compared with the new FTSM, the FTSM control strategy can achieve a higher lateral deflection distance at the same maximum deflection power.

3、The advantage of the new FTSM is greater when the terminal guidance time is less. Compared with the FTSM, the new FTSM can reach the deflection position quickly at a lower maximum deflection power.