

Optimized Control of Roll Stability of Missile using Genetic Algorithm

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Abstract : The article focuses on the study of automatic flight control on missiles during operation. The quality standards and characteristics of missile operations are very strict, requiring high stability and accurate response to commands within a relatively wide range of work. The study analyzes the linear transfer function model of the Missile Roll channel to facilitate the development of control systems. A two-loop control structure for the Missile Roll channel is proposed, with the inner loop controlling the Missile Roll rate and the outer loop controlling the Missile Roll angle. To determine the optimal control parameters, a genetic algorithm is applied. The study uses MATLAB simulation software to implement the genetic algorithm and evaluate the quality of the closed-loop system. The results show that the system achieves better quality than the original structure and is simple, reliable, and ready for implementation in practical experiments.

Keywords : genetic algorithm, roll channel, two-loop control structure, missile

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