飛機在陣風中之飛行性能分析

An aircraft is always flying in a turbulent atmosphere, and suffers the impact of atmospheric gust winds. The net effect is that this aircraft will change its attitude angle, altitude, and trajectory in a almost randomly fashion, and represents a severe hazard in aviation safety problem. The purpose of this project is to understand the response behavior of several types of aircraft under different gust wind models, in order to investigate the flight characteristic conditions, and improve their flight safety situations. Through the use of four different methods such as Laplace transfer, linear and nonlinear equations of motion, the Boeing 747 transport aircraft's response behavior were fully investigated and compared under vertical wind gust and horizontal head wind influences. Results show that the two Runge-Kutta methods agree well, and will be the best compromise of accuracy and realistic response.