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大气扰动及其对飞行的影响

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A REVIEW OF PROGRESS IN THE STUDY OF ATMOSPHERIC DISTURBANCE AND ITS EFFECT ON FLIGHT

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摘要

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**摘要** 大气紊流和风切变等现象会影响飞机的飞行品质,并且可能引起严重的飞行事故。本文简要回顾和评述了目前国外研究大气紊流和风切变问题的情况。包括近年来国外在低空大气扰动对飞行影响方面的研究,在改进数学模型、计算与分析方法以及研究与大气扰动有关的飞行品质规范等方面取得的进展。文中同时回顾了我国研究大气扰动对飞行的影响方面的情况。

**关键词:**

**Abstract:** A tmospheric turbulence and wind shear are aviation hazards which damage the flying qualities and safety of aircraft. It has been reported that low level atmospheric disturbances were responsible for a number of air accidents. A brief review given in this paper includes researches on the mechanizm of turbulence, development of engineering mathematic models for describing the atmospheric turbulence, such as the non-Gaussian model, the discrete gust model and the modified von Karman model. In addition, the experimental techniques for measurement of the turbulence in the air or for modelling the turbulence near the ground in wind tunnels are also considered. The various methods for evaluating the responses of aircraft to atmospheric turbulence and the ways for simulating the turbulence in the time domain are summarized. It is noticed that the current research works tend to stressing the problems related to low level winds. Great progress has been extended in improving the mathematical wind models and the methods for calculating and analyzing the effect of the wind on the flight and in investigating the flying qualities of aircraft in the presence of winds. Recent research works concerning flight in atmspheric turbulence and wind shear are also reviewed. Then, the wind shear models, such as the 3D-downburst model and the worst case wind model are introduced. Finally, some suggestions are proposed for further research in this respect.

**Keywords:**

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