عنوان مقاله:

A numerical investigation on the roll damping coefficient of a typical airship based on the computational fluid dynamics

محل انتشار:

نوزدهمین کنفرانس بین المللی انجمن هوافضای ایران (سال: 1400)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

The main application of dynamic coefficients is in the flight path simulation and autopilot design of flying objects. This paper reveals a general process for calculating the roll damping coefficient of a typical airship. The process presented in this article has a step-by-step path that can be used to calculate the roll dumping coefficient of all projectiles and flying objects. The method applied in this paper is fully numerical and the dynamic coefficient will be extracted from the Fluent software using the moving reference frame (MRF) techniques. In this process, first, the roll moment coefficient is extracted from the fluent using the moving reference frame technique, and then the roll damping coefficient will be calculated using some relations presented in this paper. At the beginning of the present work, the general process of calculating dynamic coefficients is discussed. This process is then used to calculate the dynamic coefficient of a typical geometry.The results of the present work and the process of calculating this coefficient, which is fully discussed in this article, can be used to calculate this coefficient in other flying objects with similar geometry. In order to validate the present article, the results of the present work are validated with the results of another article.Acceptable agreement of the results of the present work with references, proves the correctness of the process presented in this paper for calculating this dynamic coefficient.

کلمات کلیدی:

Dynamic coefficients - MRF - roll damping coefficient - CFD