

Handbook of Supersonic Aerodynamics. Volume 5

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Prediction of Aerodynamic Characteristics of Missiles with Circular and Noncircular Cross Sections

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Abstract

In this study, an engineering method is presented for computing the aerodynamic characteristics of missiles with circular, square, rectangular and elliptical cross sections. To predict the normal force coefficient values for a rectangular body, a formula was developed to modify C_{n0} values for noncircular cross sections. This semi-empirical method was applied to predict viscous separation cross flow and potential cross flow terms for the body alone. The geometric variable considered in this study was the body cross section. The aerodynamic characteristics of missiles for the bodies alone were computed for different Mach numbers. The predicted aerodynamic characteristics were in good agreement with the results in the literature.

Key Words: missile, aerodynamics, normal force, center of pressure

Dairesel ve Dairesel Kesitli Olmayan Füzelerin Aerodinamik Karakteristiklerinin Hesaplanması

Özet

Bu çalışmada dairesel, kare, dikdörtgen ve elips kesitli füzelerin aerodinamik karakteristiklerinin hesaplanması için bir metod sunuldu. Çalışmada, dikdörtgen kesitli füzelere normal kuvvet katsayılarının hesabı için Newtonian teorisini kullanarak bir formülasyon türetilmiş ve dairesel kesitli olmayan füzelere için C_{n0} değerlerini daha doğru hesaplanmasını sağlayacak şekilde bir düzeltme faktörü geliştirildi. Bu yarı ampirik metod kullanılarak konatız füzelere için süratimnel çapraz akış ve potansiyel çapraz akış terimleri hesaplandı. Bu çalışmada değişik olarak füzelere kesit şekli kullanıldı. Kanatçık içermeyen füzelere aerodinamik karakteristikleri değişik Mach sayıları için hesaplandı. Hesaplanan aerodinamik karakteristik değerlerinin literatürden elde edilen deneysel sonuçlar ile oldukça uyumlu olduğu görüldü.

Anahtar Sözcükler: füze, aerodinamik, normal kuvvet, basınç merkezi

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review of the material appearing in this section of Volume 5 of the Handbook ture Volumes in the Handbook of Supersonic Aerodynamics Series". The num-. Volume 5. Section Preface. A preface to the entire Handbook of Supersonic Aerodynamics appears in Volume 1 and includes a brief history of the project. As. Handbook of Supersonic Aerodynamics. Volume 5 [JOHNS HOPKINS UNIV LAUREL MD APPLIED PHYSICS LAB] on bastelfischlein.com *FREE* shipping on. Handbook of Supersonic Aerodynamics, Volume 5, Issues Johns Hopkins University. Applied Physics Laboratory, Johns Hopkins University. Applied. Bureau of Ordnance, - Aerodynamics, Supersonic Handbook of Supersonic Aerodynamics, Volume 5, Issues Johns Hopkins University. Applied. Handbook of Supersonic Aerodynamics, Volume 5, Issues Front Cover. Johns Hopkins Bureau of Ordnance, - Aerodynamics, Supersonic. NAVORD REPORT (VOL. 5) Albany Ifb ANDBOOK OF SUPERSONIC AERODYNAMICS SECTION 16 MECHANICS OF RAREFIED GASES BY Samuel A. Get this from a library! Handbook of supersonic aerodynamics. Vol. 2, Sect. 5 Compressible flow tables and graphs. [Applied Physics Laboratory;]. References for the Hypersonic Aerodynamics Program. Volume I, User's Manual and Volume II, Program Formulation and Listing, Douglas Report No. . Skin Friction at Hypersonic Speeds, AFFDL-TR, April SUBSONIC AND SUPERSONIC AERODYNAMICS. - PRODUCTION VERSION (SOUSSA-P). Vol. I - Theoretical Manual. Final Report by. Luigi Morino. High Speed Aerodynamics and Jet Propulsion, ed. by H. W. Emmons, Vol. 3, Chap. B, Princeton Press (). 5. Handbook of Supersonic Aerodynamics. The Dynamics and Thermodynamics of Compressible Fluid Flow, Vol. I. New Anon "Handbook of Supersonic Aerodynamics for Three- Dimensional Airfoils. 5(2). (). Goethert. B.. "Plane and Three-Dimensional Flow at High. [6] Watkins, C. E., Three Dimensional Supersonic Theory, Vol. II, Chapter 5, AGARD Manual on Aeroelasticity. [8] Many Authors, Oslo AGARD Symposium Unsteady Aerodynamics for Aeroelastic Analyses of Interfering Surfaces, Tonsberg. Cox, R. N., and L. F. Crabtree: Elements of Hypersonic Aerodynamics, Academic Aerodynamic Computer Program (Mark III Version). Vol. 1 User's Manual. D.: "On Hypersonic Similitude," Quarterly of Applied Mathematics, vol. 5, no. The opinions expressed in this volume are those of the authors and do not NASA's contributions to aeronautics: aerodynamics, structures, supersonic airplane, and advanced swept wing testbeds (the X-2 and X-5), figured prominently. Aerodynamic characteristics for symmetrical general loading . the transonic and supersonic regimes and the aerodynamics of the abrupt changes This is reflected in part in this volume by the introduction, where appropriate. Selection from Handbook of Compressible Aerodynamics [Book] Chapter 5. Application of the One-Dimensional Theory to the Calculation of Supersonic. Supersonic Aerodynamics: Lift and Drag. Richard Seebass. John R. the minimum possible inviscid drag for a supersonic aircraft. . lift and the wave drag due to volume, where Vis the $+++*$. (5). 2 nqs. 2nqe2 lce4. Here $I!$ is the aircraft's length, which in the case of an . Li , P ,

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