Accepted Manuscript

Regular refraction of an oblique shock wave at the tangential discontinuity

Vladimir V. Upyrev, Pavel V. Bulat

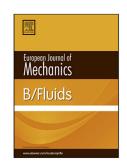
PII: S0997-7546(18)30354-6

DOI: https://doi.org/10.1016/j.euromechflu.2018.07.019

Reference: EJMFLU 3339

To appear in: European Journal of Mechanics / B Fluids

Received date: 30 May 2018 Revised date: 27 July 2018 Accepted date: 30 July 2018



Please cite this article as: V.V. Upyrev, P.V. Bulat, Regular refraction of an oblique shock wave at the tangential discontinuity, *European Journal of Mechanics / B Fluids* (2018), https://doi.org/10.1016/j.euromechflu.2018.07.019

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Regular Refraction of an Oblique Shock Wave at the Tangential Discontinuity

Vladimir V. Upyrev, Pavel V. Bulat*

Federal State Budget Educational Institution of Higher Education Baltic State Technical

University Voenmeh D.F.Ustinov, St. Petersburg, Russia

*Corresponding author: bulat.p@yahoo.com

Abstract

This article is devoted to the regular refraction of an oblique shock wave at the tangential

discontinuity. The calculations were performed for an ideal gas model using the numerical

and analytical methods for solving the equations called the dynamic compatibility conditions

at the tangential discontinuity. Basic equations are given. This article examines the domains

of shock wave configurations with various types of reflected discontinuities within them,

including characteristic refraction (induced by the change in char), and refraction patterns

with a reflected shock and a reflected rarefaction wave. Each refraction domain was mapped

by type with regard to the Mach number, adiabatic exponents of two flows, and the intensity

of a refracted oblique shock wave. The boundary between the regular and irregular refractions

was found. Research results can be applied to simulate the shock waves processes that occur

in rotating detonation engines, as well as in stationary detonation engines.

Key words: shock wave, refraction, reflected discontinuity, discontinuity along characteristic

surface (char), rarefaction wave.

1. Introduction

Download English Version:

https://daneshyari.com/en/article/7050880

Download Persian Version:

https://daneshyari.com/article/7050880

<u>Daneshyari.com</u>