## Accepted Manuscript

The supersonic flow past a wedge with large curved boundary

Dian Hu

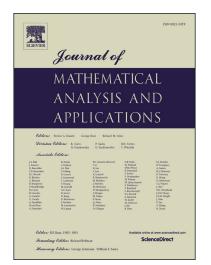
 PII:
 S0022-247X(18)30107-0

 DOI:
 https://doi.org/10.1016/j.jmaa.2018.01.069

 Reference:
 YJMAA 22002

To appear in: Journal of Mathematical Analysis and Applications

Received date: 13 September 2017



Please cite this article in press as: D. Hu, The supersonic flow past a wedge with large curved boundary, *J. Math. Anal. Appl.* (2018), https://doi.org/10.1016/j.jmaa.2018.01.069

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.

### ACCEPTED MANUSCRIPT

#### THE SUPERSONIC FLOW PAST A WEDGE WITH LARGE CURVED BOUNDARY

#### DIAN HU

ABSTRACT. In this paper, we construct a piecewise smooth solution for a 2-D supersonic potential flow past a curved wedge, whose boundary is assumed to have large variation. In fact, we originally provide a background solution, which is constructed by assuming the coming flow has limit speed. Its shock coincides with the curved wedge and the flow behind the shock is defined only along the wedge. Then our problem can be treated as a perturbation of this background solution and the solution is obtained by showing certain estimates.

#### Contents

1.	Introduction		1
2.	A Special Case		3
3.	Characteristic Decomposition		4
4.	Proof of Theorem 1.1		7
Acknowledgments			11
Re	ferences		11

#### 1. INTRODUCTION

In this paper, we employ the following 2-dimensional steady irrotational Euler system to describe the flow fields

$$\begin{cases} (\rho u)_x + (\rho v)_y = 0, \\ v_x - u_y = 0, \end{cases}$$
(1.1)

where (u, v) denotes the velocity field,  $\rho$  the density,  $p = A\rho^{\gamma}$  the pressure. Since (1.1) is a conservation law, for a piecewise smooth solution, it holds the Rankine-Hugoniot condition

$$\begin{cases} [\rho u]\phi' = [\rho v], \\ [v]\phi' = -[u], \end{cases}$$
(1.2)

Date: February 5, 2018.

<sup>2000</sup> Mathematics Subject Classification. 35L65,35L67,35M10,35B35,76H05,76N10.

Download English Version:

# https://daneshyari.com/en/article/8899867

Download Persian Version:

https://daneshyari.com/article/8899867

Daneshyari.com