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An overview of research on waverider design methodology

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Abstract: A waverider is any supersonic or hypersonic lifting body that is characterized by an attached, or nearly attached, bow shock wave along its leading edge. As a waverider can possess a high lift-to-drag ratio as well as an ideal precompression surface of the inlet system, it has become one of the most promising designs for air-breathing hypersonic vehicles. This paper reviews and classifies waverider design methodologies developed by local and foreign scholars up until 2016. The design concept of a waverider can be summarized as follows: modeling of the basic flow field is used to design the waverider in the streamwise direction and the osculating theory is used to design the waverider in the spanwise direction.

Keywords: hypersonic vehicle; waverider; aerodynamic design methodology; basic flow field

1. Introduction

A waverider is any supersonic or hypersonic lifting body that is characterized by an attached, or nearly attached, bow shock wave along its leading edge. Because of the excellent aerodynamic configuration of the waverider, it has always attracted the attention of researchers,

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