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新一代引射式跨音速风洞 (IDT) 高要求指标的研究

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DEVELOPMENT OF A SECOND GENERATION INJECTOR DRIVEN TRANSONIC WIND TUNNEL AT BUAA

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摘要

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摘要

本文介绍了北京航空航天大学IDT-1甲型引射式前导性跨音速风洞的研究工作,包括风洞实验段动态气流品质及引射效率 (G_T/G_J) 等方面。在采取了多种技术措施后,表征实验段脉动压力的参数值达到或接近Lowson公式和Mabey准则所给出的值,使风洞这类性能进入世界同类研究的先进行列。引射效率和气流的湍流度也达到相当好的水平。实验研究还表明引射驱动方式应用于跨音速风洞具有光明的前景。

关键词: 跨音速风洞 引射式风洞 声学特性 湍流度 效率

Abstract:

The development of an injector driven transonic pilot wind tunnel (0.1 XXX 0.1m2 in size, type IDT-1A) in BUAA. is presented in this paper. The efforts consist of the improvements in dynamic flow quality and mass efficiency (G_T/G_J). Through various technical treatments, the pressure fluctuation level in the test section of IDT-1A, having contented or approached Lowson's Formula and Mabey's Criterion, has met the advanced world standard. The mass ratio and free stream turbulence have attained to considerably good level. Experimental results show a promising prospect for utilizing the injector driven technique in advanced transonic wind tunnels.

Keywords: transonic tunnel ejection type wind tunnel acoustic characteristics turbulence efficiency

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