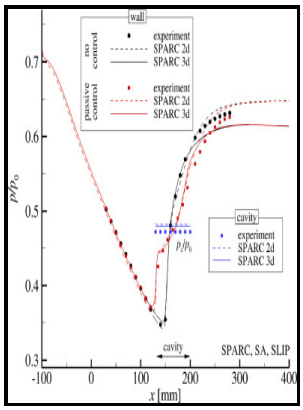
Evaluation of measured-boundary-condition methods for 3D subsonic wall interference

National Aerospace Laboratory - Correction for wall



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Wind tunnel walls
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-Evaluation of measured-boundary-condition methods for 3D subsonic wall interference
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A numerical approach for assessing slotted wall interference using the CRM model at ETW

Practically, no Reynolds number effects on the wall pressure distributions generated by the model and its support system could be identified over the wide range of Re numbers investigated. Subject To reference this document use: Publisher Access restriction Campus only Source NLR-TR 88072 U Part of collection Aerospace Engineering Reports Document type report Rights c 1988 National Aerospace Laboratory NLR Files campus only.

Evaluation of measured

The review is made on the methods of wall interference corrections and boundary condition measurements in connection with the T-128 test technique development. The main results of the transport aircraft test are presented and analyzed.

Correction for wall

The method is based on the assumption that the flow velocity is known at a control surface surrounding the model and that the main part of the flow field may be considered irrotational and subsonic. The first attempt of the EWT-TsAGI code application for a simulation of ETW tests featuring the model in the slotted wall tunnel showed a fair coincidence of the pressure coefficient distribution on test section walls in the model region, on the wing-root sections and the drag polar at moderate lift coefficient values. The applicability is illustrated by means of some numerical test cases.

Correction for wall

The improved corrections based on the locally measured relationships between disturbed velocity components near upper and lower walls are applied to the experimental results. Typical sources of systematic errors in the wind tunnel tests are considered and analyzed with emphasis on the prediction of wall interference problems. The experimental part of the investigation was performed in February 2014 by testing the NASA Common Research Model mounted on a fin-sting support.

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