CFD Boundary Layer Analysis of a Flight Test Installed Rake

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Abstract

Nowadays CFD is a technique that is continuously growing up in airplane manufacturing business, becoming the main tool used for external aerodynamics analysis. To ensure reliability in data obtained by CFD comparison with real aircraft experimental data is a must.

A boundary layer rake was installed on a commercial airplane at rear-end of the fuselage. Different measurements of total pressure were obtained. These measurements were compared with CFD analysis and recommendation concerning quality assurance of the simulation were developed.

This study gives good results at outer boundary layer, showing maturity of CFD for that area. The results also show the influence of the mesh on the boundary layer profile. Specific care has to be taken to resolution of the near wall area in order to resolve correct boundary layer development at that far rear position on the aircraft.

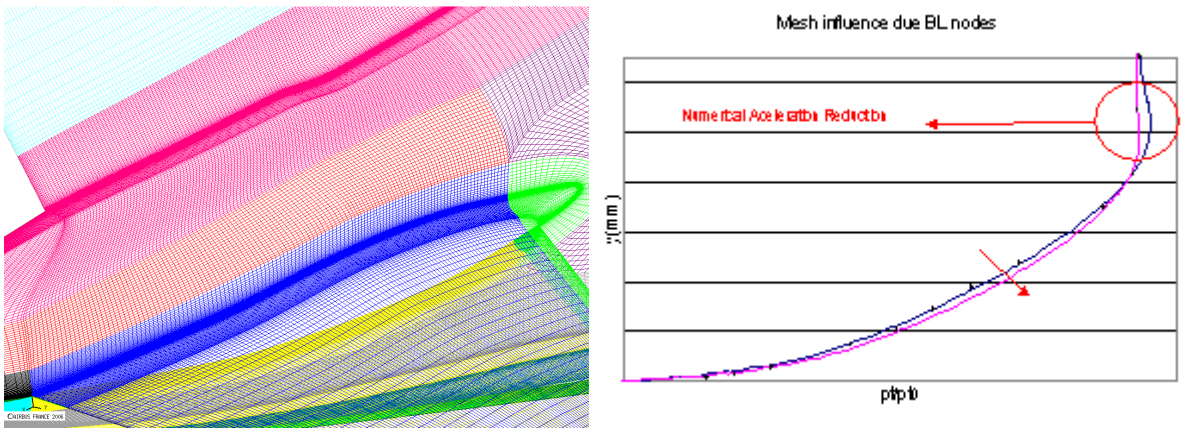

Figure 1 Mesh Used and influence of BL nodes in the solution

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