

Enhanced Visualization Methods for Interpretation of Wind Tunnel Data

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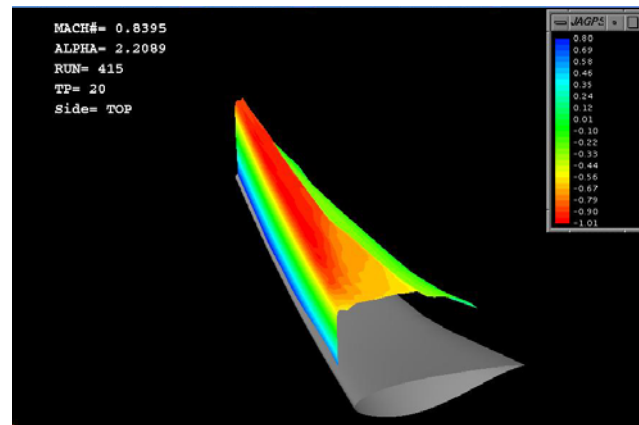


Fig. 1. Enhanced representation of wing Cp data

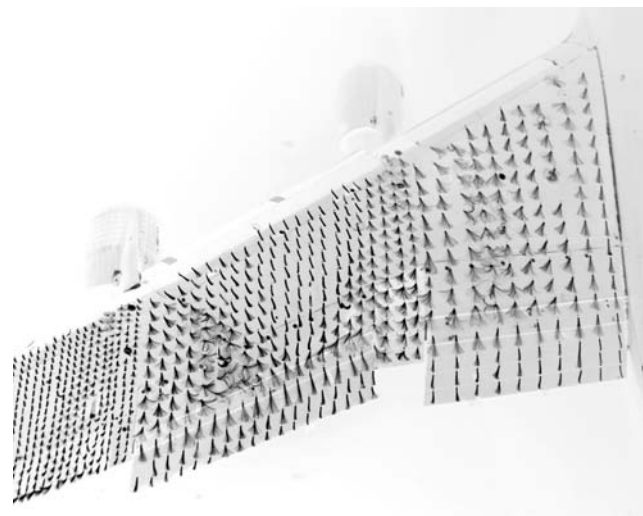


Fig. 2. Enhancement of tuft still image through composite imaging of digital stills

Digital post-processing techniques have been utilized to enhance the presentation of wind tunnel data to facilitate the understanding of flow field phenomena. Fig. 1 presents the full wing pressure distribution for a 777-200 wind tunnel model taken directly from experimental data and presented in a 3-dimensional “mountain” plot. It can be seen that the use of color and perspective presents a much more intuitive representation of the data than traditional 2D sectional plots can provide. Fig. 2 shows the time varying behavior of fluorescent mini tufts on the upper surface of a 747-400 low speed wind tunnel model. This image was constructed by compositing 6 separate still images taken at 10-second intervals into one and then applying a few digital image enhancement filters. The processed image conveys more information about how the tufts behave over time thereby providing an improved qualitative sense of the character of the airflow on the wing.