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应用表面热膜测定NACA0012翼型边界层转捩区位置的实验研究

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AN EXPERIMENTAL INVESTIGATION ON LOCATION OF BOUNDARY LAYER TRANSITION ON THE NACA 0012 USING SURFACE HOT FILM GAGES

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摘要 本文所述的实验研究,是将自行研制的M-I型表面热膜用于测定NACA0012翼型上表面的转捩区的实验。当翼型迎角α改变时转捩区位置随之改变,见图3。实验证明这种技术是令人满意的。

关键词：

Abstract： In order to locate the boundary layer transition experimentally, the selfmade surface hot film gages M-1 were flush stuck on the upper surface of the NACA 0012 airfoil at distances from the leading edge x/b = 0. 4, 0. 5, 0.6, 0.7, 0.8. The experiments were carried out in a low speed wind tunnel. Measuring instrumentation comprised a tsi 1050 hot wire anemometer, tsi 1070 RMS voltmeter and a MS-5511 memory oscilloscope and gave electric voltage E, fluctuating voltage RMS Erms and the oscillograms of the voltage.During the tests the Reynolds number was kept constant Reb = 2×105 while the angle of attack was varied. The hot film gages at the different distances x/b gave values of E, Erms and oscillograms as shown in Fig. 2 and Fig. 3 . Three characteristic points for laminar boundary layer separation, maximum Erms and turbulent boundary layer attachment were obtained from these results. Hence the boundary layer transition was located （Fig. 4）.The experimental investigation shows that the technique of locating the boundary layer transition with the selfmade surface hot film gages M-1 is feasible.

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