

The flow around wing 445.6 was modelled using Navier–Stokes equations and S-A model. The wing vibration and flow mesh deformation were computed using a fast dynamic mesh technology proposed by our own group. Wing 445.6 flutter was analysed through a strong coupling between the wing vibration and flow. The reduced flutter velocity was predicted and results are in good agreement with the experimental data. It is found that the subsonic flutter is mainly induced by the flow separation and the transonic and supersonic flutter are mainly caused by the oscillating shock wave and its induced flow separation. The positive aerodynamic work increases due to the oscillating shock wave when the subsonic flow becomes transonic reducing the flutter velocity. While the positive aerodynamic work induced by the oscillating shock wave decreases when the transonic flow becomes supersonic increasing the flutter velocity. That is why the transonic dip exists.