

CFD/CSD approach to evaluate the aeroelastic response of a hypersonic vehicle wing

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Abstract: A coupling numerical simulation technology which combined computational fluid dynamics (CFD) method with computational structure dynamic (CSD) is developed. Several kinds of coupling strategy to exchange data on fluid and solid interface are designed. The aeroelastic response of hypersonic wing under Ma 5 wind tunnel experimental condition is calculated. The numerical simulation results are compared with results using unsteady piston theory method. The influence of coupling strategy is discussed. The computed results indicate that using CFD/CSD method to predict aeroelastic response of hypersonic vehicle is feasible and credible.

Key Words: *CFD/CSD, aeroelastic response, hypersonic*

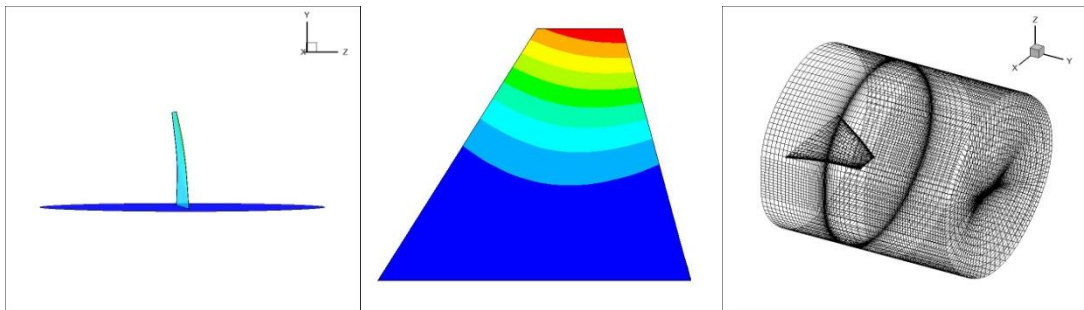


Figure 1 Deformed wing and grids

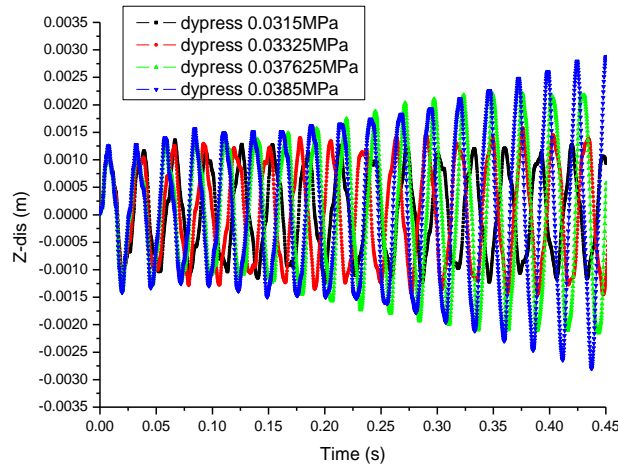


Figure 2 Hypersonic wing flutter boundary prediction

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