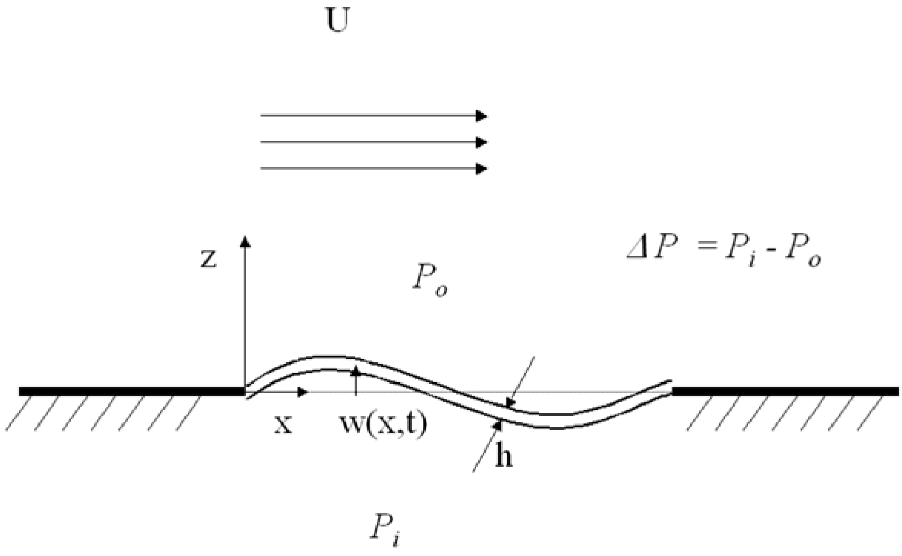

Figure 1. Schematic of the underlying principles used in the problem formulation.

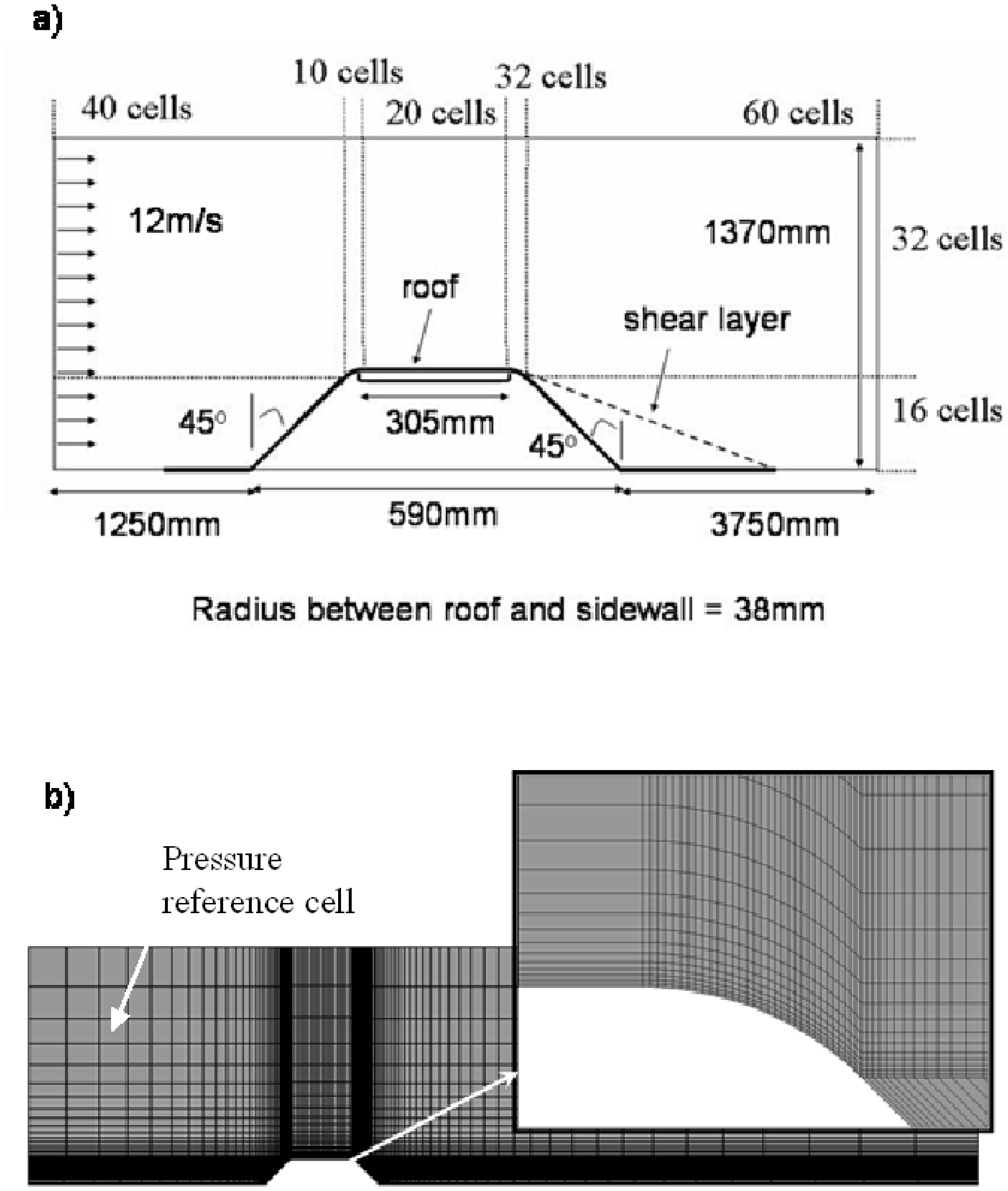

Figure 2. (a) Two-dimensional computational domain with base mesh cell allocation (domain not to scale), and (b) The mesh used for the Navier-Stokes solution of the flow field.

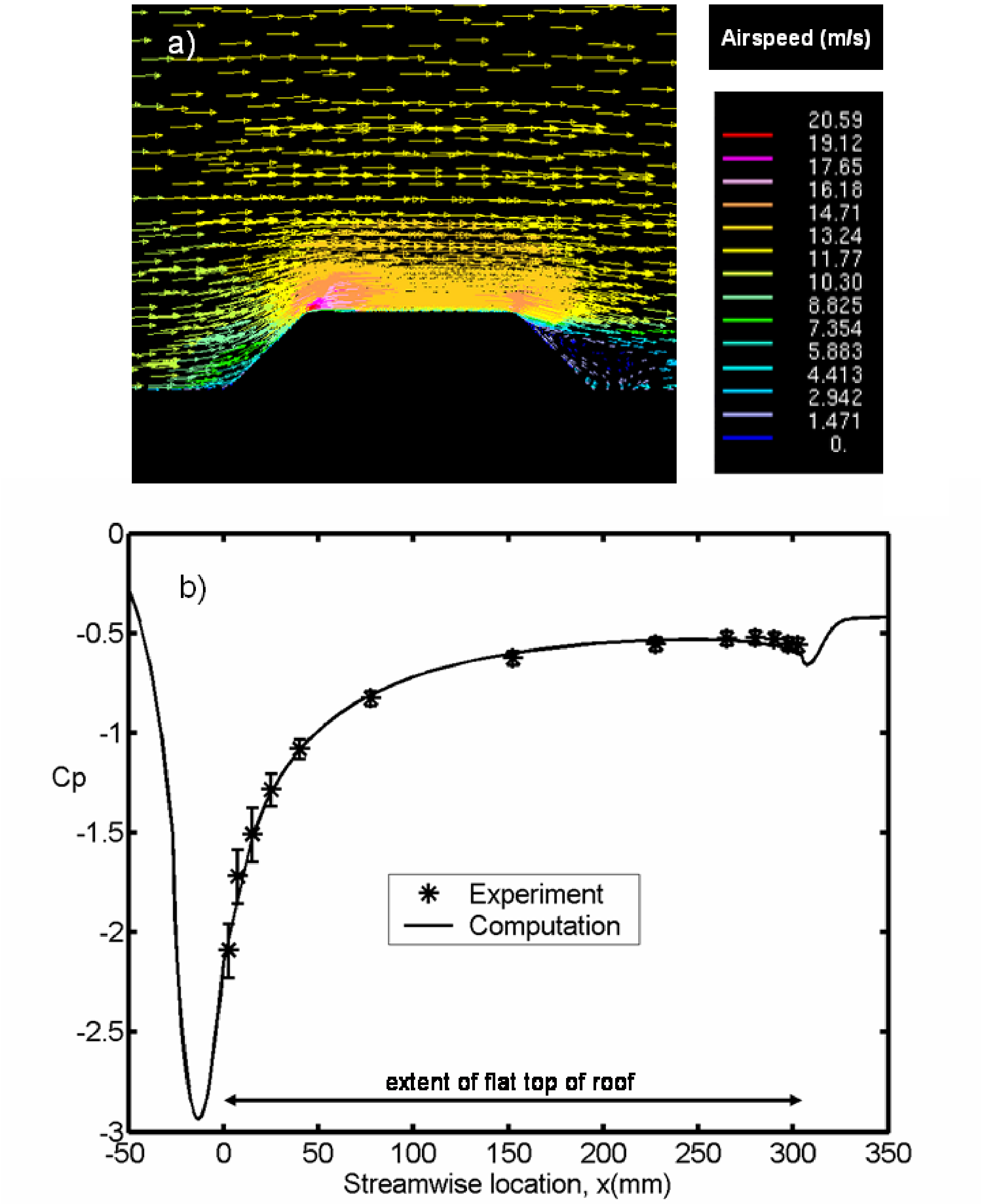

Figure 3. (a) Computed (Navier-Stokes) velocity vectors of the flow field for a wind speed $U = 12$ m/s, and (b) Comparison of two-dimensional experimental and computed pressure distributions through the variation of pressure coefficient over the roof of the model car.

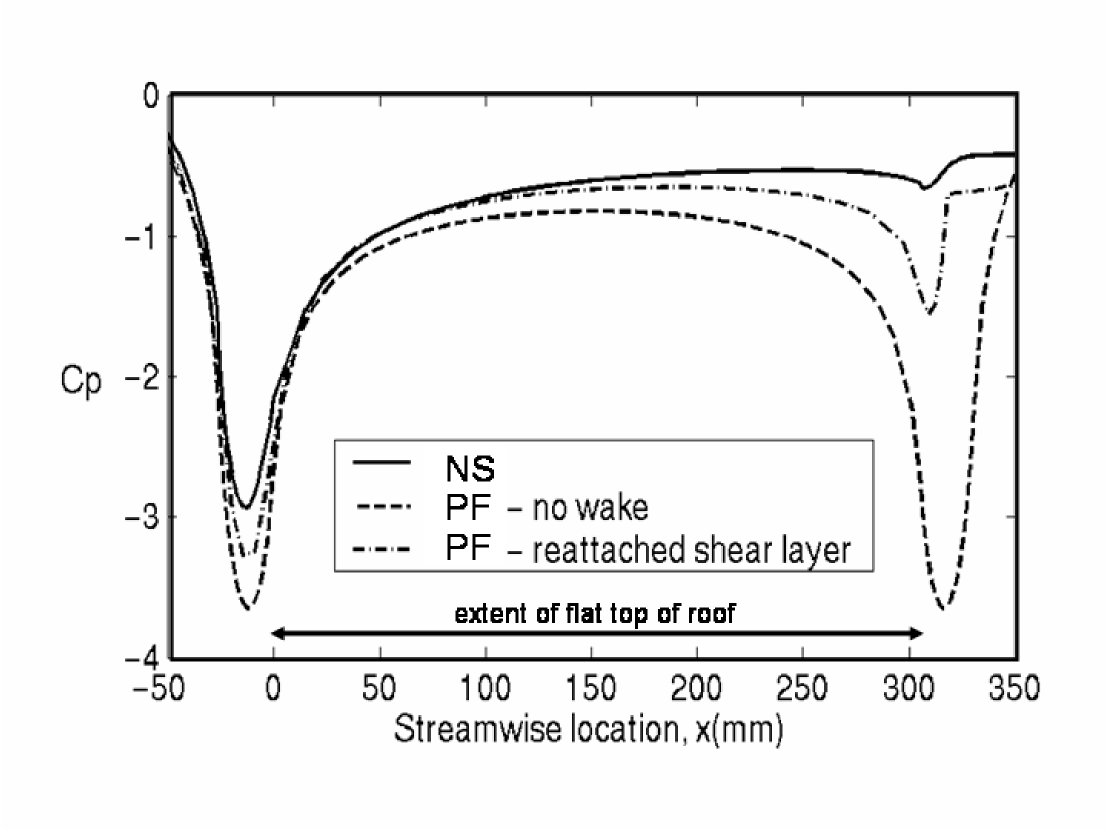

Figure 4. Computed pressure distribution over the roof of the model car; comparison of the predictions of potential-flow and Navier-Stokes solvers.

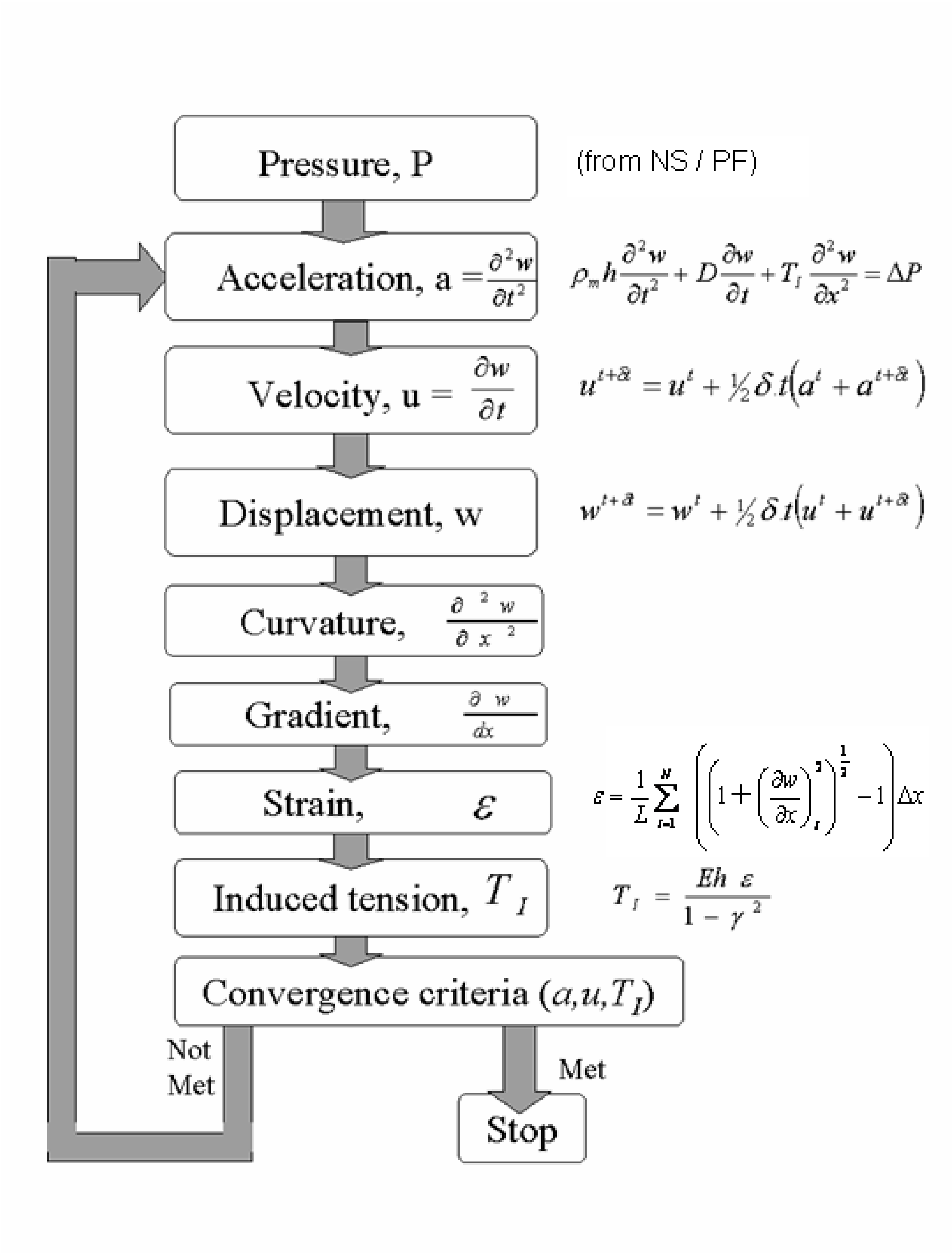

Figure 5. Dataflow diagram used in structural code.

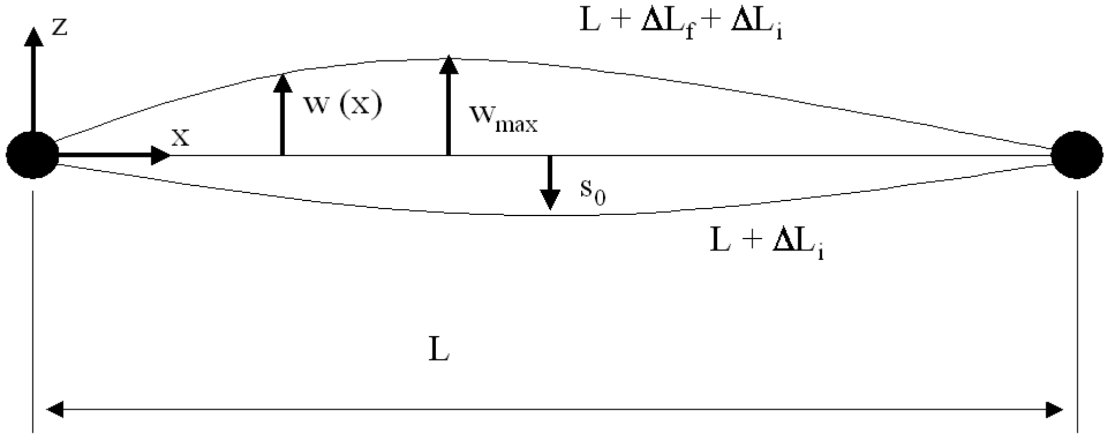

Figure 6. Schematic of membrane initial slackness and deflection under loading.

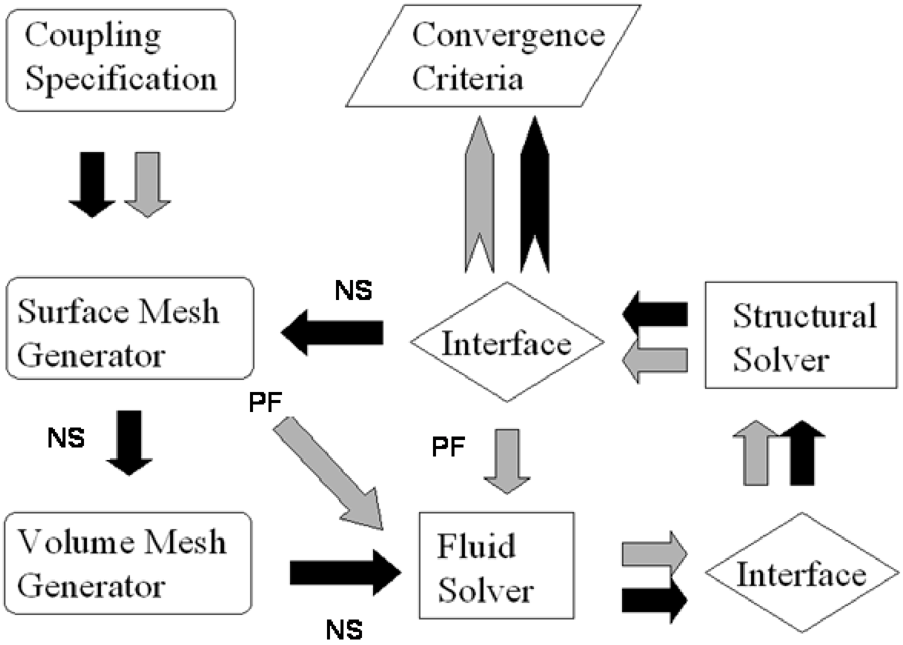

Figure 7. Displacement coupled algorithm using potential-flow and Navier-Stokes solvers.

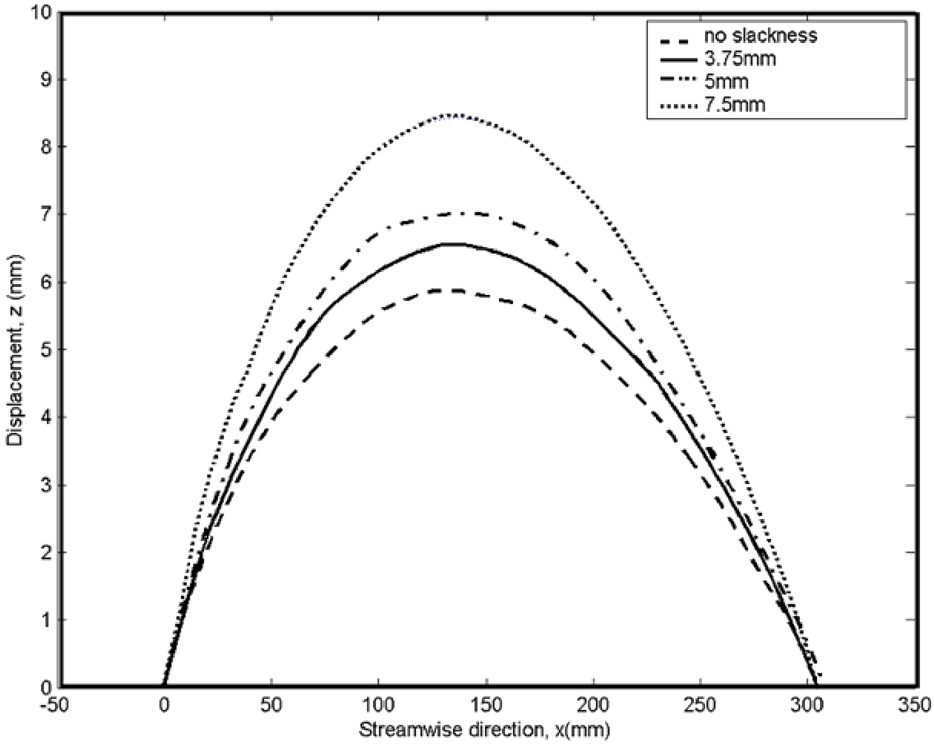

Figure 8. Computed deflections of membrane roof for different slackness values. (*Eh*=78,600 N/m, *U*=12 m/s)

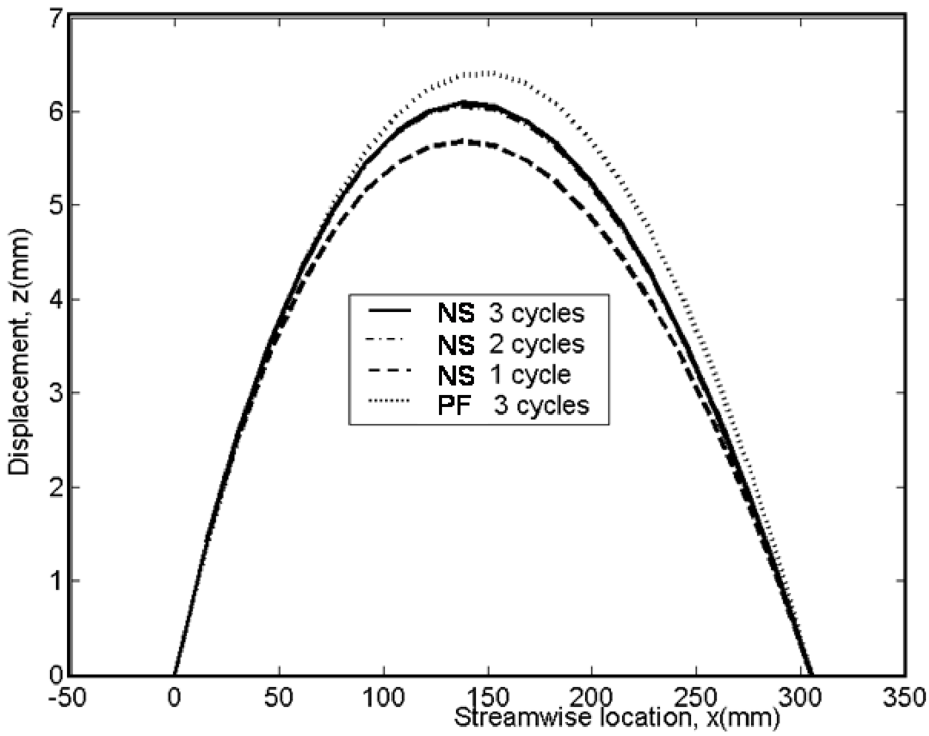

Figure 9. Computed membrane-deformation profile showing convergence of the NS-based solution and a comparison of this with the PF-based solution. (*Eh*=78,600 N/m, *U*=12 m/s)

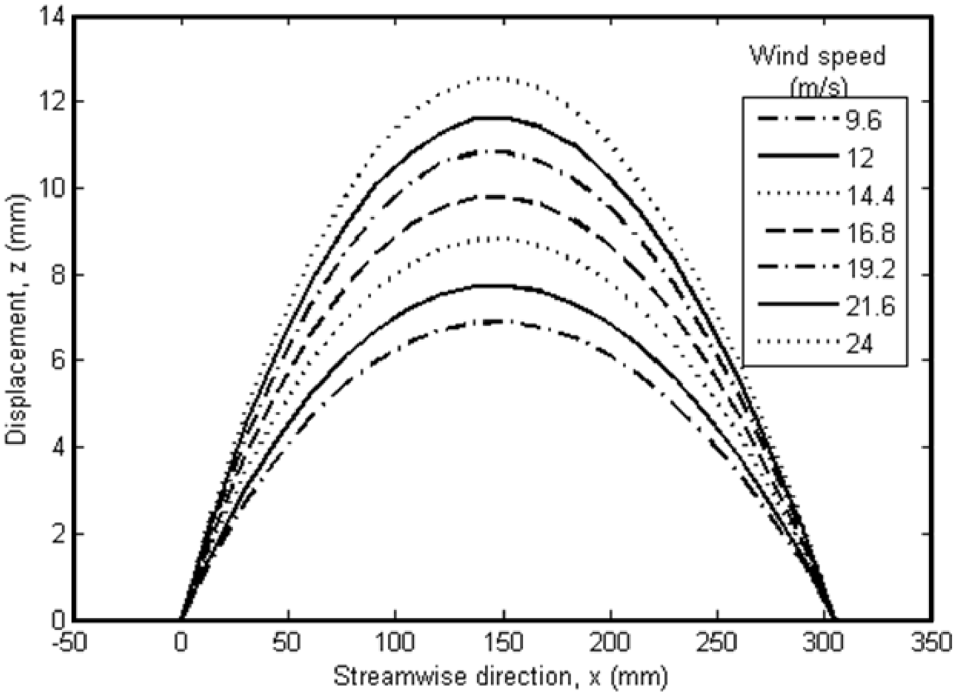

Figure 10. Computed membrane-deformation profile for various wind speeds.

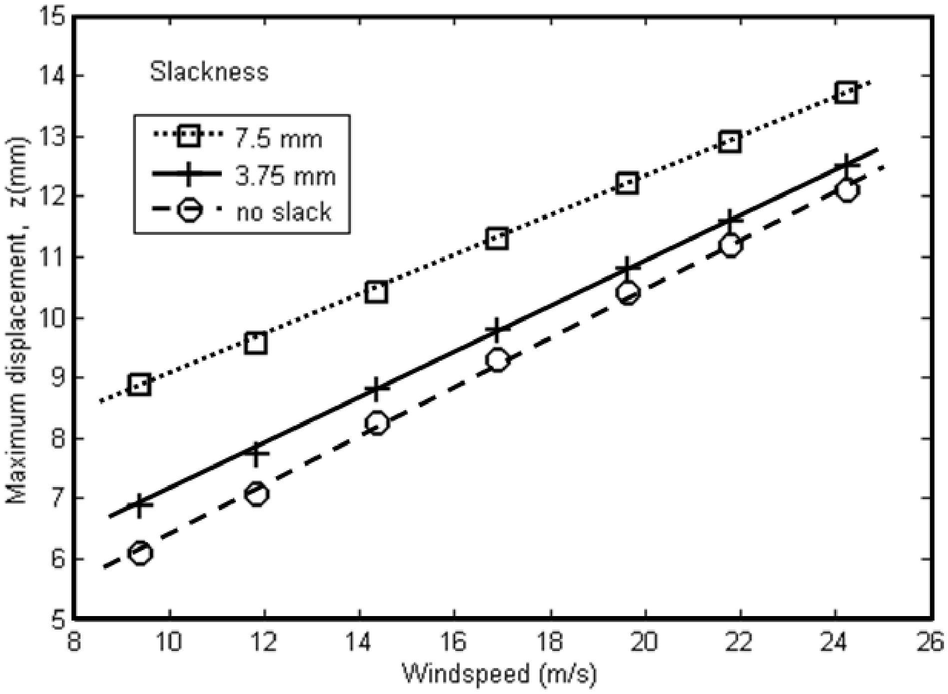

Figure 11. Variation of maximum membrane deformation with wind speed for various values of initial slackness and fixed material properties, *Eh*=78,600 N/m. (The straight lines of best fit have been added to aid interpretation of the data.)

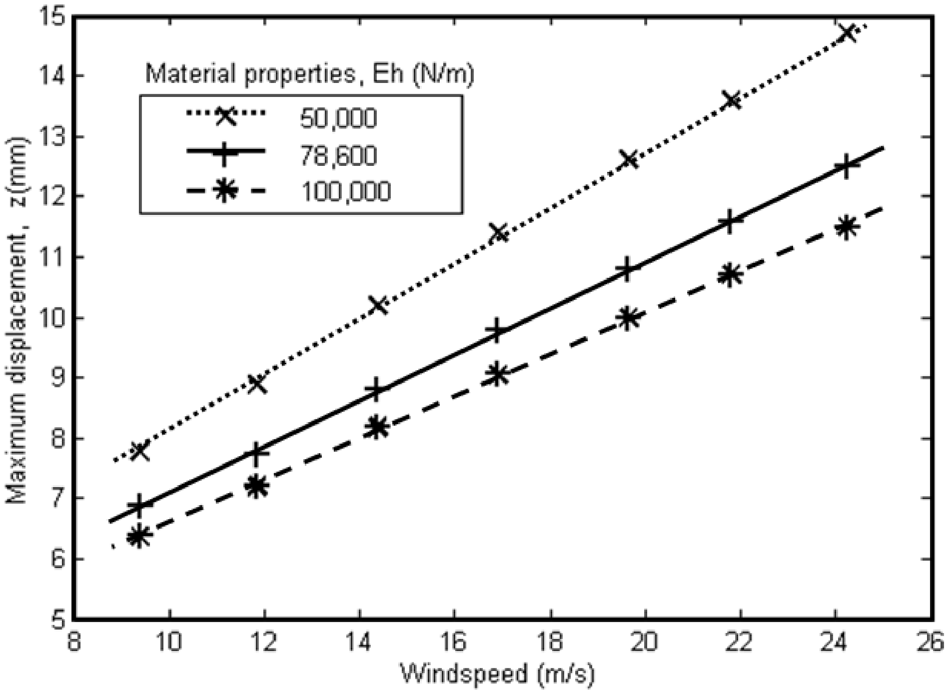

Figure 12. Variation of maximum membrane deformation with wind speed for various material properties and fixed slackness, 3.85 mm. (The straight lines of best fit have been added to aid interpretation of the data.)