Abstract: In this paper a numerical approach of a time-dependent fluid-structure coupling for membrane and thin shell structures with large displacements is presented. The frame algorithm is partitioned, yet fully implicit because of a predictor-corrector scheme being applied to the structural displacements within each time step. In order to reach a high modularity, two powerful codes run simultaneously and exchange fluid loads and displacements within each fluid-structure iteration. The finite volume based CFD code is able to compute three-dimensional, incompressible, turbulent flows. The structural simulations are performed using a finite element program including algorithms for geometrically and physically non-linear problems. In this paper the coupled algorithm will first be applied to some geometrically simple test cases to validate the interaction scheme. Then a real-life textile tent structure of glass-fibre synthetics with a complex shape is taken into account. This example was investigated under turbulent flow conditions at a high wind speed leading to a steady deformation state.
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