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Technical Comments

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Comment on "Parallel Implementation of Structural Dynamic Analysis for Parachute Simulation"

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THE parallel structural dynamics (SD) implementation described in this paper [1] is the same as the parallel SD implementation described in [2] as part of the parallel three-dimensional computational method developed for modeling parachute fluid-structure interactions (FSI). Kalro and Tezduyar ([2], published in 2000), has a section with the heading "Parallel Implementation." The first sentence of that reads, "Both the flow and SD solvers have been implemented for parallel computation within a message-passing programming environment." Another sentence in that section reads, "The parallel implementation of the individual solvers are essentially identical." Those parallel implementations for the fluid dynamics and SD solvers were used also in the three-dimensional parachute FSI computations reported in [3], also published in 2000. The first sentence of its abstract reads, "We present a parallel computational strategy for carrying out 3-D simulations of parachute fluid-structure interaction (FSI), and apply this strategy to a round parachute."

Before the received date of this article (3 Dec. 2004; revision received 4 Dec. 2005), at least six more journal papers (see, for example, [4–6]), 23 conference papers (including five AIAA papers), and three Ph.D. theses were published on various aspects of parallel computation of parachute FSI. In all those papers and theses, the parallel computations reported were based on parallel implementation of both the fluid dynamics and SD.

The following statements made in the article are inaccurate or imply something that is inaccurate.

1) Introduction: "Unfortunately, usage of parallel computation techniques in the area of parachute simulation has been limited."

2) Introduction: "Most of the available parallel developments and implementations in parachute simulations focus on the computational fluid dynamic (CFD) area.[7]"

3) Introduction: "Coupled fluid-structure simulation, the most accurate simulation approach for parachute behavior, requires both CFD simulation and SD simulation. Thus, it is necessary to develop an efficient parallel SD analysis algorithm, as well as a parallel CFD analysis algorithm." This implies that the existing parachute FSI models do not include parallel SD solvers.

4) Section III: "A number of researchers have addressed the parallel techniques used in the CFD analysis of parachute simulation.[7,15,16]" This implies that the parallel solution techniques used in earlier parachute simulations have been limited to the fluid dynamics solver.

5) Section III: "The parallel communication techniques employed by them are adopted in this research for the convenience of combining the SD analysis and CFD analysis to produce coupled fluid and structural simulation." This implies that the SD and CFD analyses were not before combined to produce a coupled FSI simulation.

References

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[4] Tezduyar, T., and Osawa, Y., "Fluid-Structure Interactions of a Parachute Crossing the Far Wake of an Aircraft," *Computer Methods in Applied Mechanics and Engineering*, Vol. 191, No. 6, 2001, pp. 717–726.

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[6] Stein, K., Tezduyar, T., and Benney, R., "Computational Methods for Modeling Parachute Systems," *Computing in Science & Engineering*, Vol. 5, No. 1, 2003, pp. 39–46.

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