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**A strong coupling partitioned approach for fluid–structure interaction with free surfaces.**

(English) [Zbl 1181.76147](#)

[Comput. Fluids 36, No. 1, 169-183 \(2007\)](#).

Summary: Fluid–structure interaction (FSI) problems are of great relevance to many fields in engineering and applied sciences. One wide spread and complex FSI-subclass is the category that studies the instationary behavior of incompressible viscous flows and thin-walled structures exhibiting large deformations. Free surfaces often present an essential additional challenge for this class of problems. Prominent application areas are fluid sloshing in tanks and numerable problems in offshore engineering and naval architecture. Especially when partitioned strong coupling schemes are used in order to solve the coupled FSI problem the design of an appropriate overall computational approach including free surface effects is not trivial. In this paper a new so-called partitioned implicit free surface approach is introduced and embedded into a strong coupling FSI solver. For complex problem classes this approach is combined with the general elevation equation that is closed through a dimensionally reduced pseudo-structural approach. The presented approach shows the same stability properties as a full implicit approach but is by far more efficient—especially in the partitioned coupled case.

**MSC:**

[76T99](#) Multiphase and multicomponent flows

Cited in **32** Documents

**Full Text:** [DOI](#)

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