

SHARING ADVANCES IN MODELLING AND NUMERICAL TECHNIQUES FOR FLUID-STRUCTURE INTERACTION

VINCENT FAUCHER* AND GUILLAUME RICCIARDI*

* CEA, DES, IRESNE, Nuclear Technology Department
Center of Cadarache, Saint-Paul les Durance, 13108, France
vincent.faugher@cea.fr, guillaume.ricciardi@cea.fr

ABSTRACT

In the continuity of the successful Invited Session with the same name at Coupled 2023, the proposed Invited Session aims at gathering and sharing latest research in terms of advanced modelling for fluid-structure coupling.

It is based on the observation that depending on the applicative communities, a large variety of methods is implemented, from very refined approaches relying on the explicit representation of fluid-structure interfaces through Arbitrary Euler-Lagrange representation, to approaches emphasizing on robustness such as immersed boundaries or porous media, with the need then to assess their accuracy. The expected program thus aims at bringing together the knowledge acquired for all these techniques used in conjunction with different sets of equations for the fluid, for instance for incompressible turbulent flows, multiphase flows or compressible flows... interacting with various models for the structure in a wide range of dynamic regimes.

Showing results in the state-of-the art management of some key issues of general interest whatever the community is encouraged. Among the many edge topics of interest, like the management of complex non-linearity such as immersed contact, from both theoretical and practical points of views, or coupling of models of different natures (i.e, particles, finite elements, finite volumes, lattice Boltzmann...), some contributions are in particular expected in the fields of:

- i) efficient and robust partitioned coupling and its extension to extreme scale computing,
- ii) validation for complex fluid structure problems including advanced experiments coupled to simulation (see for instance ref [1]).

Review contributions of recent and significant research in the field of modelling for fluid-structure interaction are also welcome in the Invited Session among other contributions focused on specific new advances.

REFERENCE

- [1] V. Faucher, H. Palancher, G. Ricciardi, M.-A. Puscas, E. Lo Pinto, L. Rossi, Recent developments in coupled experiments and simulation to understand the fluid-structure dynamics of a Pressurized Water Reactor fuel assembly, Nuclear Engineering and Design, Volume 420, 2024, 113054.