The Shifted Boundary Method:
A new approach to embedded domain computations.

Guglielmo Scovazzi*, Alex Main*, Ting Song*, Nabil Atallah*

* Civil & Environmental Engineering Department, Duke University, Durham (NC), USA
e-mail: guglielmo.scovazzi@duke.edu, geoffrey.main@duke.edu, ting.song@duke.edu,
nabil.atallah@duke.edu

ABSTRACT

Embedded boundary methods obviate the need for continual re-meshing in many applications involving rapid prototyping and design. Unfortunately, many finite element embedded boundary methods for incompressible flow are also difficult to implement due to the need to perform complex cell-cutting operations at boundaries. We present a new, stable, and simple embedded boundary method, which eliminates altogether the need to perform cell cutting, and its performance is demonstrated on large-scale incompressible flow problems, solid mechanics, shallow water flows.