

Simulating a Heart Valve using a Varying Permeability Approach

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Models of total heart function include computational fluid dynamics models of blood flow. The effect of heart valves upon flow patterns can be taken into account by a fictitious domain approach in combination with the Navier-Stokes-Brinkman equations.

The motion of the valve is represented by means of a spatio-temporal varying permeability function while the underlying mesh remains unchanged.

We present first proof-of-concept simulations of blood flow to demonstrate feasibility.