

Research Report (April, 2017 - March, 2018)

Enrollment from
April 2017

Department of Modern Mechanical Engineering

Takuya TERAHARA

I. List of Papers

K. Takizawa, T.E. Tezduyar, **T. Terahara**, and T. Sasaki, "Heart valve flow computation with the integrated Space-Time VMS, Slip Interface, Topology Change and Isogeometric Discretization methods", *Computers & Fluids*, **158** (2017) 176–188.

II. List of Talks

T. Terahara, K. Takizawa, T.E. Tezduyar, and T. Sasaki, "Heart valve flow analysis with the integrated space-time VMS, slip interface, and topology change methods and isogeometric discretization", in *2017 Engineering Mechanics Institute Conference*, California, USA, (2017).

III. Research Results in AY2017

Toward a fluid–structure interaction (FSI) analysis of a heart valve problem, first structural mechanics computation was carried out. The mesh is based on cubic T-splines, which can represent geometry with continuous curvatures over the entire domain. After that fluid mechanics computation including valve closing and opening with NURBS based mesh.

IV. Research Plan for AY2018

There are two important steps in this year. One is the mesh motion which allows collapsing and reborn the elements. The other one is developing a method for moving internal interfaces that allow the slip of the contacting location.