

# 理工学研究所

## 国際交流・公開研究セミナー

Prof. Tayfun Tezduyar (米国, ライス大学) が来日される機会に, 最近その応用が注目されている Space-Time 有限要素法について, 基礎となる理論と流体構造連成に関する応用に関してご講演をお願いしました. 是非ご参集ください.

題 目 : Space-Time FSI Computation: It's Worth It  
講演者 : Prof. Tayfun Tezduyar  
(アメリカ, ライス大学)  
日 時 : 2017 年 7 月 31 日(月) 10:40 - 12:10  
場 所 : 中央大学 後楽園キャンパス 6号館 7階 6701 号室

### アブストラクト:

Computational analysis of fluid-structure interactions (FSI) and flows with moving boundaries and interfaces (MBI) quite often requires high-resolution representation of boundary layers near solid surfaces. Moving-mesh methods, such as the ALE and space-time (ST) methods, where the mesh moves to follow the fluid-solid interface, enables that high-resolution representation. However, moving-mesh methods are quite often thought of as being not practical in computation of complex FSI and MBI problems. Actually, they are practical in more classes of complex FSI and MBI problems than commonly thought of. We show what a good moving-mesh method can now do, and what a good ST method can do beyond that, which now includes being able to maintain high-resolution representation of boundary layers near moving solid surfaces even when there is contact between the solid surfaces. We show how these advanced ST FSI methods we have developed enable accurate computational analysis in many classes of FSI and MBI problems, ranging from spacecraft parachute FSI to wind-turbine aerodynamics, from flapping-wing aerodynamics of an actual locust to fluid mechanics of a heart valve model. This is a joint work with Professor Kenji Takizawa, Department of Modern Mechanical Engineering, Waseda University, Tokyo.

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