武蔵野大学　第60回記念MCMEセミナー

第60回

Takeshi Takaishi 氏 (Musashino Univ.)
Atsushi Suzuki 氏 (Osaka Univ. / RIKEN)
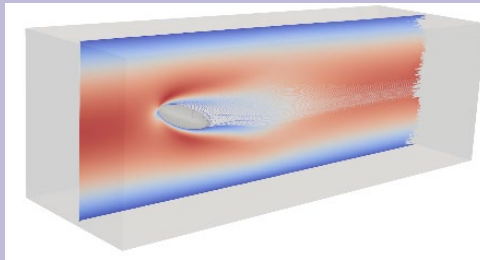**Pierre Jolivet 氏 (CNRS)**

FreeFEM - now and in the future

13:30 - 14:00 Takeshi Takaishi (Musashino Univ.) :
"**Introducing some simple problems to solve with FreeFEM**"
FreeFEM is a popular 2D and 3D partial differential equation (PDE) solver used by thousands of researchers worldwide. This makes it easy to implement your own mathematical models using simple scripts. We will see its capabilities through some examples.

14:10 - 14:55 Atsushi Suzuki (Osaka University / RIKEN):
"**Variational problem with constraint and linear solvers for indefinite problem**"
Variational setting is the mathematical foundation of the finite element methods for several industrial problems. It is sometimes necessary to deal with problem with constraint, e.g., in fluid problem, Navier-Stokes equations contain incompressibility constraint. The discretized equations are expressed by a KKT system whose coefficient matrix is indefinite. We will view robustness and efficiency of the GMRES method with preconditioner based on LDU-factorization with proper pivoting strategy to avoid instability from the indefiniteness.This methodology is also applicable to inequality constraint problem appeared in a shape optimization problem.

15:10 - 16:40 Pierre Jolivet (CNRS) :
"**Deep dive into FreeFEM ecosystem**"
One of the strengths of FreeFEM is its ability to interact seamlessly with many other scientific libraries, such as MPI for parallel computing, PETSc for (mostly) linear algebra, SLEPc for eigenvalue computation, or HPDDM for domain decomposition methods. In this presentation, I will highlight some design decisions made over the years in order to enable researchers and developers to use FreeFEM as a flexible tool to prototype or implement algorithms, preconditioners, or coupled solvers in different applied fields such as computational fluid dynamics, radiative transfer, solid mechanics.
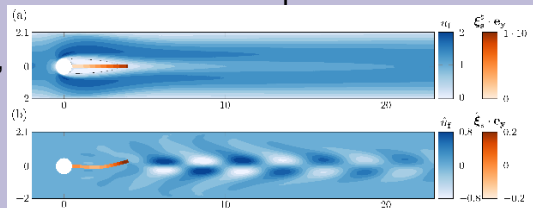
↓参加登録はこちら↓

8月28日（月）13:30–16:40

武蔵野大学有明キャンパス，5号館401教室, ハイブリッド開催

参加ご希望の方は，右上のQRコードより参加登録をお願いいたします．
参加費無料　　　登録締切：8/26(土)

国際展示6分場駅　徒歩7分
東京ビッグサイト駅　徒歩6分

コーディネーター： 高石　武史（武蔵野大学工学部数理工学科　教授）

問い合わせ先： 武蔵野大学数理工学センター
https://www.musashino-u.ac.jp/research/laboratory/mathematical_engineering/

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