第５回レジリエンス工学インターナショナルセミナー
5th International Seminar on Resilience Engineering

主催：レジリエンス工学研究センター　Hosted by : Resilience Engineering Research Center

トピックス : Topics

マルチスケール・マルチフィジックスシミュレーション
Multiscale and Multiphysics Simulation

日 時 : Date

2018/11/30 13:30 ～ 15:30

場 所 : Venue

工学部８号館 226 室
Room-226, Faculty of Engineering Building 8

プログラム : Program

14:00 ～ 15:30 Lecture

Adhesive particle dynamics in complex fields: a discrete-element method
Prof. Shuiqing Li (Tsinghua University)

Abstract:

As particles become sufficiently small, interparticle adhesion begin to play an important role in a variety of natural phenomena and industrial processes. In this lecture, a novel discrete-element method (DEM) for adhesive particles across 1 to 100 microns is developed to deal with particle dynamics in complex fields. Computational models for adhesive contact forces and torques, liquid bridging forces, long-range electrostatic and hydrodynamic interactions are simultaneously implemented into a multiple-time step DEM framework. The computational method is then illustrated by various kinds of applications, including (1) packing problems of dry/wet/charged particles; (2) clogging of neutral/charged particles during microfiltration; (3) migration of particles in fluid flows with low/high Reynolds numbers. By performing statistical analysis on a large number of simulation cases, we are able to build connections between particle level interaction and macroscopic system behavior. At last, we give our conclusions, as well as describe interesting future challenges in the development of DEM for adhesive particulate flows.

Prof. Shuiqing Li

Profile :

Shuiqing Li is a Professor at the Department of Energy and Power Engineering, Tsinghua University. He obtained both his B.S. and Ph.D. degree in Engineering Thermophysics from Zhejiang University and has been a visiting scientist at the University of Leeds (2004-2005), the University of Iowa (2006), Princeton University (2010-2011), Yale University (2014), and RWTH Aachen University (2018). Current research interests of Prof. Li include dynamics of particulate flow, combustion dynamics, gas-phase material synthesis, clean coal technology and pollutant control technology. Prof. Li has more than 100 peer-reviewed papers, published on Prog. Eng. Combust. Sci., Phys. Rev. Lett., and J. Fluid Mech., etc. Prof. Li is a recipient of the National Young and Middle-aged Leading Scientists, Engineers and Innovators (2018), the National Science Fund for Distinguished Young Scholars (2017), the National Award for New Century Excellent Talents (2009) and the Tsinghua University Award for Young Talents on Fundamental Studies (2011).

連絡先 : Contact

参加希望者は 11/26 までにご連絡ください。
Please register by November 26th via e-mail.

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