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Title:

R&D of Combustion Simulation Platform for advanced industrial design processes by academia-industry cooperation

by
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Abstract:

Due to commitment to the international CO₂ reduction framework and increased awareness of environmental problems, higher efficiency and lower emissions are increasingly demanded for many industrial combustion systems. On the other side, competition becomes more severe due to globalization, more efficient and faster development of the products which meet local and customized needs are necessary. With the rapid development of digital technology, combustion simulation is one of the solutions. Moreover, “digital twin” that is combination with big data of real system creates real and cyber system, and it has potential to lead to a more efficient development process.

As simulation and modeling of practical combustion system is large scale and complicated, the development requires knowledge and technology of many interdisciplinary areas. It is difficult to find out economic rationality about separately developing those even for large enterprise and more reasonable to define fundamental area as non-competitive and acquire them through collaboration and alliances, and companies can concentrate more on their own product development.

This article introduces a R&D project of the Combustion Simulation Platform for advanced industrial design process undertaken as academia-industry cooperation program of Combustion Society of Japan.

Key words:

Numerical simulation, Industrial design process, Academia-Industry cooperation,
Combustion Simulation Platform

Short CV

ACADEMIC DEGREE

- 1996 D. Eng., Mechanical Engineering, Tohoku University
- 1988 M. Eng., Mechanical Engineering, Tokyo Institute of Technology

EMPLOYMENT AND PROFESSIONAL EXPERIENCE

- 2015-present Incumbent
- 2011-2015 Deputy Director, Research Laboratory, Corporate Research & Development
- 2007-2011 Manager, Department of Heat and Fluid Mechanics, Research Lab., Corp. Research & Development
- 2003-2007 Manager, Department of Combustion Technology, Energy Power Plant Division.
- 1988-2003 Research Engineer, Corporate Research Laboratory, Ishikawajima-Harima Heavy Industries Co. Ltd. (Predecessor organization of IHI)

MAJOR RESEARCH AND DEVELOPMENT EXPERIENCE

- 2014-present R&D of ammonia combustion GT and Boiler and SOFC for hydrogen energy career
- 2003-present R&D of twin-fluidized gasifier for lignite and biomass
- 2003-present R&D of oxyfuel coal firing power plant boiler
- 2003-2009 R&D of low volatile coal firing power plant boiler
- 1997-2002 R&D of high temperature combustion technology (HiCOT) industrial furnaces
- 1988-2002 R&D of dry low NOx gas turbine combustion technology

ACADEMIC SOCIETY ACTIVITIES

- 2016-present Board of Director, the Combustion Institute
- 2017-present Vice president, Combustion Society of Japan

He started his career as a combustion researcher and engineer at IHI Corporation and joined various development projects for gas turbine combustion and coal combustion for power plant boilers. His major contributions are on developments for oxy-fuel combustion of pulverized coal firing boiler and novel twin fluidized bed gasification of lignite.

From 2014, he has been a general manager of business development department for energy management and new mobility business area. He is now a board of director of the Combustion Institute and a vice president of the Japanese Section.