



## Atsushi SAKURAI, Dr. Eng.

Assistant Professor

Program: Advanced Materials Science and Technology

Area: Advanced Mechanical Science and Engineering

Undergraduate: Dept. of Engineering

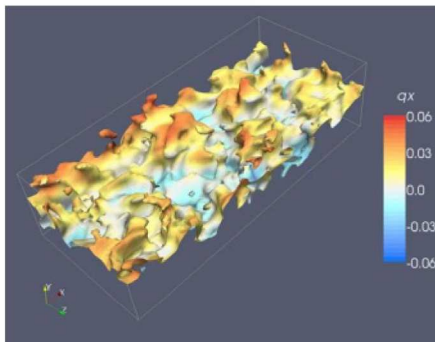
<http://radiative-transfer.blogspot.com/>

### Professional Expertise

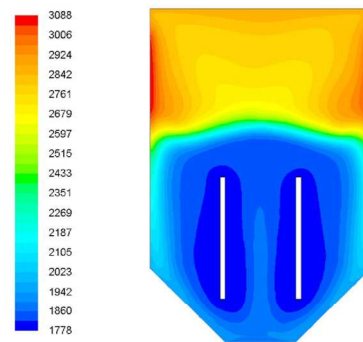
My major research field is called *radiative transfer*. The term radiative transfer is commonly used to describe the science of energy transfer caused by electromagnetic waves, or photons. Accordingly, radiative transfer is important in the field of *solar energy applications*.

Research interests are in the area of solar thermal power generation and solar fuel production applied to new energy conversion technology with renewable energy. Heat and mass transfer in a solar energy application are studied by using simulation and experiment.

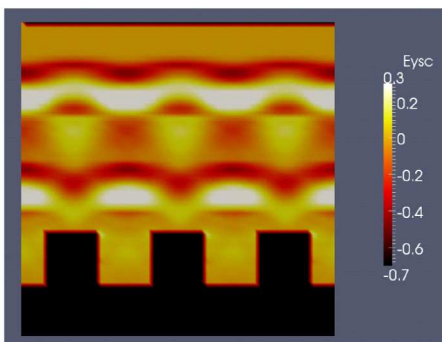
### Research Fields of Interest



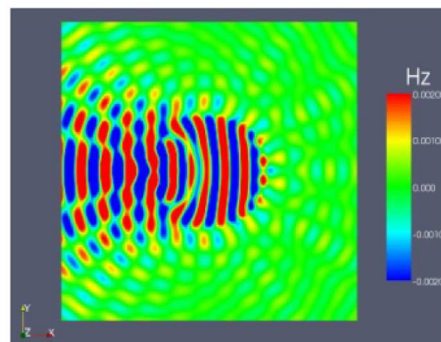
Coupled analysis of radiative transfer and turbulent flow for solar thermal power generation



Thermal design of solar fuels production using multiphysics simulation



Computational electromagnetics for high-efficiency solar light absorber



Light scattering from nonspherical particles for solar thermochemical reactor

## Education

2007: Doctor degree of Eng., Graduate School of Engineering, Dept. of Mechanical systems and Design, Tohoku University.

2005: Master degree of Eng., Graduate School of Engineering, Dept. of Mechanical systems and Design, Tohoku University.

2003: Bachelor degree of Eng., Graduated from School of Engineering, Dept. of Mechanical systems and Design, Tohoku University.

## Professional Societies and Activities

1. The Heat Transfer Society of Japan
2. The Japan Society of Mechanical Engineers
3. The Japan Society of Thermophysical Properties
4. The Visualization Society of Japan

## Major Publications

[1] "Spatially advancing coherent structures in curved channel turbulent flow", Koji Matsubara, Atsushi Sakurai, Kenya Yamazaki, Makoto Takeda, Physics of Fluid, Vol.23, pp.065102 – (12 pages) (2011).

[2] "Heat transfer characteristics and Reynolds stress budget of spatially advancing turbulent flow in curved channel", Koji Matsubara, Takahiro Miura, Atsushi Sakurai, Kenya Yamazaki and Makoto Takeda, Numerical Heat Transfer, Part A: Applications, Vol. 60, No. 3, pp. 234-253 (2011)

[3] "The Radiation Element Method Coupled with the Bioheat Transfer Equation Applied to the Analysis of the Photothermal Effect of Tissues", Atsushi Sakurai, Shigenao Maruyama, and Koji Matsubara, Numerical Heat Transfer, Part A: Applications, Vol.58, No.8, pp.625 - 640(2010)

[4] "Heat transfer characteristics and Reynolds stress budgets in single-rib mounting channel", Takahiro Miura, Koji Matsubara and Atsushi Sakurai, Journal of Thermal Science and Technology, Vol.5, No.1, pp.135 - 150(2010)

[5] "Radiation Element Method Coupled with the Lattice Boltzmann Method Applied to the Analysis of Transient Conduction and Radiation Heat Transfer Problem with Heat Generation in a Participating Medium", Atsushi Sakurai, Subhash C. Mishra and Shigenao Maruyama, Numerical Heat Transfer, Part A, Vol.57, No.5, pp.346 - 368(2010)

[6] "Coupled Photon and Heat Transport Simulation inside Biological Tissue for Laser Therapy", Atsushi Sakurai, Isami Nitta, Shigenao Maruyama, Junnosuke Okajima and Koji Matsubara, Journal of Thermal Science and Technology, Vol.4, No.2, pp.314 - 323(2009)

[7] "An Efficient Method for Radiative Heat Transfer Applied to Turbulent Channel Flow", Atsushi Sakurai, Shigenao Maruyama, Koji Matsubara, Takahiro Miura, Masud Behnia, ASME Journal of Heat Transfer, Vol.132, No.2, pp.023507 - (7 pages)(2009)

[8] "Optimal Number and Location of Heaters in 2-D Radiant Enclosures Composed of Specular and Diffuse Surfaces Using Micro-Genetic Algorithm", Ali Safavinejad, Shigenao Maruyama, Seyed Hossein Mansouri and Atsushi Sakurai, Applied Thermal Engineering, Vol.29, pp.1075 - 1085(2009)

[9] "Evaluation Method for Radiative Heat Transfer in Polydisperse Water Droplets", Shigenao Maruyama, Hiroataka Nakai, Atsushi Sakurai, and Atsuki Komiya, Journal of

Quantitative Spectroscopy and Radiative Transfer, Vol.109, pp.1 - 15(2008)

[10] "A spatially advancing turbulent flow and heat transfer in a curved channel", Koji Matsubara, Akihiko Matsui, Takahiro Miura, Atsushi Sakurai, Hitoshi Suto, Koji Kawai, Heat Transfer - Asian Research, Vol.39, No.1, pp.14 - 26(2009)

[11] "Optimal Boundary Design of Radiant Enclosures Using Micro-Genetic Algorithm (Effects of refractory properties and aspect ratio of enclosure on heaters setting)", Ali Safavinejad, Shigenao Maruyama, Seyed Hossein Mansouri and Atsushi Sakurai, Journal of Thermal Science and Technology, Vol.3, No.2, pp.179 - 194(2008)

[12] "Discrete Ordinates Radiation Element Method for Radiative Heat Transfer in Three-Dimensional Participating Media", Shigenao Maruyama, Atsushi Sakurai, and Atsuki Komiya, Numerical Heat Transfer, Part B: Fundamentals, Vol.51, pp.121 - 140(2007)

[13] "Three-Dimensional Phonon Transport Simulation for Nano/Micro-Structured Materials", Atsushi Sakurai, Shigenao Maruyama, Atsuki Komiya, Koji Miyazaki, International Journal of Nanoscience, Vol.7, No.2-3, pp.103 - 112(2008)

[14] "The Effect of Three-Dimensional Radiative Heat Transfer in Cloud Fields Using the Radiation Element Method", Atsushi Sakurai, Shigenao Maruyama, Seigo Sakai, and Toru Nishikawa, Journal of Quantitative Spectroscopy and Radiative Transfer, Vol.97, pp.79 - 87(2005)

[15] "Comparison of Radiation Element Method and Discrete Ordinates Interpolation Method Applied to Three-Dimensional Radiative Heat Transfer", Atsushi Sakurai, Tae-Ho Song, Shigenao Maruyama, and Hyun Keol Kim, JSME International Journal, series B, Vol.48, No.2, pp.259 - 264(2005)