

**International Specialist Workshop on
Open-Loop versus Closed-Loop Control of Wall Turbulence
Tokyo, March 18-19, 2010**

Sponsored by Global Center of Excellence for Mechanical Systems Innovation, The University of Tokyo

Venue: Room 31A, Eng. Bldg. 2, School of Engineering, The University of Tokyo

Organizing committee: Nobuhide Kasagi (Univ. Tokyo, Chair)
Koji Fukagata (Keio Univ.)
Yosuke Hasegawa (Univ. Tokyo, Secretary General)
Kaoru Iwamoto (Tokyo Univ. Agriculture and Technology)

Schedule:

March 17 (Wed)

17:00-19:00 *Reception*

March 18 (Thu)

Opening Session

9:30-9:55 Nobuhide Kasagi (Univ. Tokyo)

Session 1a. Open-loop control (Chair: Kaoru Iwamoto)

10:00-11:00 Maurizio Quadrio (Politecnico di Milano, Italy)

“Drag-reducing characteristics of the generalized spanwise Stokes layer:
experiments and numerical simulations”

11:00-11:15 *Coffee break*

11:15-12:15 Gary N. Coleman (Southampton Univ., UK)

“DNS of spanwise-shear-induced drag reduction revisited”

12:15-13:45 *Lunch*

Session 1b. Open-loop control (Chair: Haecheon Choi)

13:45-14:15 Koji Fukagata (Keio Univ.)

“Drag reduction or pumping by streamwise traveling wave”

14:15-14:45 Kaoru Iwamoto (Tokyo Univ. Agriculture and Technology)

“Active pump control of pulsating turbulent flow for drag reduction”

14:45-15:15 Yosuke Hasegawa (Univ. Tokyo)

“Dissimilar control of momentum and heat transfer in wall turbulence”

15:15-15:30 *Coffee Break*

Session 2. Open loop control in spatially-developing flow (Chair: Gary Coleman)

- 15:30-16:00 Tamer Zaki (Imperial College, UK)
“Elongated boundary layer structures:
their origin, signature, and influence on boundary layer stability”
- 16:00-16:30 Philipp Schlatter (KTH, Sweden)
“Turbulent boundary layers:
a) passive transition delay & b) Structure at high Reynolds numbers”
- 16:30-17:00 Sylvain Lardeau (Imperial College, UK)
“Open-loop control of high-Reynolds number flat-plate boundary layer using
synthetic jets and Lorents body forcing”
- 17:00-18:00 General discussion (Moderator: Yosuke Hasegawa)
- 18:00-20:00 *Banquet* (Conference room)

March 19 (Fri)

Session 3a. Closed-loop control (Chair: Thomas Bewley)

- 10:00-11:00 Haecheon Choi (Seoul National Univ., Korea)
“Linear proportional and integral control for fluid flow”
- 11:00-11:15 *Coffee Break*
- 11:15-11:45 Bettina Frohnafel (Darmstadt Univ., Germany)
“Estimation of the spanwise wall shear stress for closed-loop control based on
upstream information”
- 11:45-13:15 *Lunch*

Session 3b. Closed-loop control (Chair: Maurizio Quadrio)

- 13:15-14:15 Thomas Bewley (UCSD, US)
“A comparison of techniques for flowfield estimation in the presence of nongaussian
uncertainty: full Bayesian, ensemble Kalman, and a new Hybrid (variational/Kalman)
Ensemble Smoother (HEnS)”
- 14:15-14:45 Fulvio Martinelli (Ecole Polytechnique, France)
“Frequency-domain techniques for feedback flow control and estimation problems”
- 14:45-15:00 *Coffee Break*

Session 4. Summary

- 15:00-16:00 General discussion (Moderator: Koji Fukagata)
- 16:00-16:10 *Closing*

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