

# Review of the 10th ST workshop held in Kyoto, Japan

D. Gates

Presented at the NSTX Physics Mtg.

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# Workshop held at Kyoto University



# International Participation - Primarily US and Japan

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# Wed. AM

- Introductions – Maekawa (U. Kyoto host) and Peng
- Opening talk by Martin Peng. Well received.
- Mitirai (Kyushu) – Circuit models of D-He3 ST reactor....
- Tani (JAERI) – Ripple loss at low aspect ratio. Drift kinetic calculation. Finds number of coils doesn't matter at low aspect ratio. Ignores finite gyro-radius effects.
- Nagayama (NIFS) – 0-D D-He3 calculations. Conclusion: requires high  $T_i/T_e$
- Nishio (JAERI) – Presents VECTOR. Aspect ratio = 2 super conducting tokamak w/o solenoid. Argues weight power density much better than ARIES-ST and ARIES-RS.

## Wed. PM

- Harvey (CompX) – EBW-bootstrap synergy on NSTX doesn't exist. EBW and bootstrap can be calculated separately.
- Y. Ono (U. Tokyo) – Reconnection measurements on TS3/4. Extrapolates merging to large ST at 2Tesla – assumes will attain  $\Delta T_i \sim 20\text{keV}$ . Large extrapolation.

# Banquet at Ganko-Nijoen restaurant



# Thurs. AM

- Gryaznevich (Culham) – Long talk about ITER relevance. Hopes for 300kA with ST merging scheme (as per Y. Ono above). New divertor installed. Claims EBW heating observed? Error field coils installed and used – reduced density threshold for error field locking. MAST upgrade proposed.
- Ono – NSTX overview – well received.
- Sharapov (Culham) – START \*AE modes. Review.
- Myself – well received.
- Nishino – lot's of movies of NSTX divertor. Popular.

# Thurs. PM

- Wang (SUNIST) – Edge electrostatic fluctuations on SUNIST. Statistics of pulsed transport events. Very hard to understand
- Kasaki (U. Tokyo) – USXR during IRE on TST-2. Student. 2 modes in same location w/ different rotation speeds?
- Kanki (Japan Coast Guard Academy, Himeji) – 2-fluid equilibrium calculation. Finds solution. Multiple renormalizations (boundary conditions?)



# Fri. AM

- He (SUNIST) - operating improvements. Collaborative endeavor Tsinghua University, Institute of Physics (IoP), Southwestern Institute of Physics, Chinese Academy of Physics. Device description, goals of device, machine performance. Capacitor bank system. Initial diagnostics (usual). Used siliconization in SiH<sub>4</sub> and H<sub>2</sub>. Seemed to reduce density but was not an obvious win on plasma performance. Glowing helped. Planned upgrades - Upgrade OH, Gas puff control, vertical field control. Leak rate  $2e-7 \text{ Pa}\cdot\text{m}^3/\text{s} = 2e-6 \text{ atm}\cdot\text{cc}/\text{s}$ . Strange large O-ring seal.

## Fri. AM (cont.

- Garstka (U. Wisc.) – Pegasus ST. Nothing new after 12 slides. Upgrade – 6MJ of electrolytics. First plasma in late May. Still installing power supplies. Position control? Plasma gun startup. Interesting possibility.
- Cheng (PPPL) – Kinetic effects of MHD modes on NSTX. Nice talk. No flow, FLR. Large increase in ballooning threshold due to FLR. TAEs.
- Mizuguchi (NIFS) – Reconnection physics simulation with non-linear stage. Acknowledges FLR need, flow included. Current holes. Flow can be stabilizing.

- Talks available on website -  
<http://plasma47.energy.kyoto-u.ac.jp/STW2004/index.html>