Summary of Session I-A

H. W. Kugel→Overview on NSTX

- Li-PFC operations w/LITER and w/LLD in NSTX reviewed
- Performance w/LLD comparable to w/LITER
- Un-dissolved surface impurities limits LLD effects
- Inboard divertor plate to be replaced with Mo

J.S. Hu→Overview on EAST

- Improved plasma operation with LLL in EAST reviewed
- High current (1MA) and long H-mode (100s) demonstrated
- Performance comparable w/LLL and w/Li aerosol injection

R. Majeski→Overview on LTX

- Current status on LTX exps. reviewed
- Active fueling by cluster injection introduced
- High temp. wall operation w/impurities led to H-release
- LL-pool to be installed in 2011 for improved pumping

Summary and Conclusions

- LLD operation successfully demonstrated with strike point on lithium-filled surface (required for NSTX-U to have full power, long pulse Li PFC conditions)
  - Longterm thermal response dominated by thermal mass of the copper
  - No macroscopic evidence of surface damage by lithium or heating

- LLD in its effect on plasma performance did not clearly differ from evaporative lithium coatings
  - LLD static lithium surface exhibited a degradation due to D and impurity buildup during a 19 wk, 3700 discharge, experimental campaign.
  - LLD temperatures exceeded melting point of lithium but lithium compounds from impurities remained undissolved on surface

- For the first time, sufficient lithium was deposited, sufficiently fast, to allow at least 30 discharges on the LLD, and then 150 discharges on the lithiated graphite without LITER needed between discharges (can be extended for longer pulses)

- Issues of lithium vacuum chemistry need investigation for both static liquid lithium analysis, and the design of flowing lithium system for NSTX-U.

Summary

- With upgraded lithium coating system, we have successfully carried out lithium coating and many interesting results were obtained.
- Lithium coating is useful for plasma recovery.
- Lower particle recycling even if high fuel retention after lithium coating;
- The lifetime of 10-30g lithium coating is more than 100shots;
- By the coating, record lowest H/(H+D) of EAST(<10%) was got.
- Lithium coat also significantly reduced impurity radiation, Zeff~2 during plasmas, and suppressed MHD activity;
- Improve plasma confinement and Increase plasma stored energy;
- With lithium contribution, a few milestones were got for EAST.
  - Achieved 1MA plasma current;
  - Increase plasma duration to >100s.
  - Successfully obtained H-mode plasma;
  - First observed effective ICRF heating;
- After ~1kg lithium coating, thick lithium film was found, and it could be easily cleaned by de-ionized water.
- New program on flowing liquid lithium PFCs is going on.

Discussion of hot wall results

LTX

- Partial pressure of water during cold wall lithium evaporation was ~ 5 x 10^{-9} Torr
- Partial pressure of water during the hot wall experiment was ~2 x 10^{-8} Torr
- With cold walls, improved discharges were obtained for ~48 hours
- With hot walls, no improved discharges were observed
  - Delay between termination of coating and tokamak operations was 1 hour, 15 minutes
  - If the only factor affecting the condition of the lithium coating was background water pressure, coating should have been active for ~12 hours
- Therefore, hot coating passivated more quickly than can be accounted for by background water pressure
- Suspect segregation of oxygen, other impurities to the surface was responsible for rapid passivation
  - C. Skinner, poster session IIB