

## Heating, Current Drive, Operations and Diagnostics Issues

### Operations

- Understand implications of reduced repetition rate, is it adequate for the envisioned experimental program?
- Evaluate the potential of ECRH to improve startup.

### Heating

- ICRF is the base line heating system, compare with NBI and ECRH
- What are the issues associated with increasing the toroidal field to 12T?
- Does the ICRF system maintain coupling during elms?

### Current Drive

- Are wall antenna a possibility for reducing the antenna power density and providing the directionality needed for ICRF fast wave current drive?
- Is central FWCD feasible? How much current is needed for AT modes?
- More analysis is needed of Lower Hybrid for off-axis current drive in an AT mode, and for possible NTM stabilization.
- Can an LHCD launcher withstand the anticipated heat loads?

### Diagnostics

- Capability of beam diagnostics for  $J(r)$ ,  $E(r)$ , etc or replacement technique
- What divertor diagnostic capability is possible?
- Neutron streaming around diagnostic interfaces

### Plasma Control

- Will ICRF drive significant rotation on FIRE? Useful for shear stabilization?
- Evaluate methods for burn control?  $J(r)$  is slow, fueling is faster
- Consider real time 1-D simulations as part of the control system