RF Science/Technology Metrics

Alcator C-Mod

Evaluate and assess underlying physics of MCIBW poloidal flow drive.

- Establish the flow drive scaling with RF power.
- Establish the relationship of the flow drive to the RF driven density fluctuations and power deposition layer.
- Begin rudimentary modeling trying to resolve whether the flow driven is based on ponderomotive force or Reynolds stress or something else.
- Compare the effect of low field versus high field side MC surface location on driven flow.
- Compare D(He3), H(He3), and D(H) flow drive.
- Refine simple model for poloidal flow drive.
- Assess affect on transport using heat pulse analysis as a function of driven flow.
- Model transport modification due to poloidal flow.

RF Science/Technology Metrics

Alcator C-Mod

Investigate and model D(^{3}He) absorption physics ('03)

- Establish heating efficiency as function of RF power and [He3].
- Measure power to electrons as function of [He3] and RF power.
- Measure heating efficiency as a function of background plasma temperature.
- Compare heating efficiency in H-mode and L-mode.
- Detailed PCI measurements with up to 24 channels and localization.
- Compare with simulation.

Evaluate coupling efficiency and power handling capability of first lower hybrid antenna ('03-'04)

- Measure coupling efficiency as function of edge density and limiter position.
- Measure power handling as function of conditioning time, density, coupler position, and gas puffing.
- Compare impurity and density production as function of phase.

RF Modeling Needs

Alcator C-Mod

Routine full wave modeling of minority heating and mode conversion. (TORIC)

Full wave modeling of LH.

- Address spectral gap issue.
- Effect of a compound spectrum on LHCD efficiency.

Fast electron generation near LH coupler.

Modeling of MCIBW interaction with LH.