Auxiliary current drive using the electron Bernstein wave (EBW) may advance the performance of the RFP. In prior computations, a hypothetical edge-localized current is shown to suppress tearing activity, but we need to find an optimal position of the current drive. To support MST EBW studies, an integrated modeling scheme incorporates ray tracing and Fokker-Planck predictions of auxiliary current into single-fluid MHD. Simulations of low Lundquist number (S = 10^6) agree with the previous work but at MHD-time $Q = 5$, EBW shows improved results. The effect on the current profile by the EBW from edge decreases in magnitude and scales consistently as $S$ increases. Simulations reproduce the experimentally observed periodic current profile variation over a turn cycle. With EBW drive, reduction of tearing mode amplitudes is seen, but it is limited to periods between each sawtooth, which persist with up to 10 MW of rf. Progressed tearing mode amplitudes are reduced with the combination of current drive and reduced toroidal loop voltage, consistent with previous conclusions. Finally, these simulations show that the resistivity profile has a strong effect on the optimal current drive profile for mode stabilization.

**EBW current drive vs. power is approximately linear**

- Calculating current drive efficiency at 10 MW EBW in experimental-like simulations.

**Summary**

- Single fluid MHD code (Deby) modified to model current drive in the RFP
  - performed at realistic experimental parameters; minor effects of BPF discharge
  - Previous results at low $S$ ($S < 10^6$) indicate possible MHD stabilization if $S > S_{crit}$
  - Results suggest a 1 MW EBW << previous predictions for stabilization
  - Resistivity profile affects modeling results
  - 10 MW EBW current drive does not interrupt the periodic sawtooth
  - 10 MW EBW shown reduced by current sustainment relative to no case
  - Reduced loop voltage of $rf$ drive can lead to prolonged periods without sustainment
  - Plasma current ramps down
  - Deby results apply to both EBW and other rf techniques such as LHCD

**Detailed evolution of $\lambda$ profile shows clear effects of additional rf drive and reduced loop voltage**

- Current drive and toroidal loop voltage reduction begin at 10 MW of $rf$
- Ramp $\lambda$ (about 100 $\mu$s to peak)
- Simulation results in a low-dissipation profile more stable to tearing modes

**Mode reduction realized with $\lambda$ reduction + rf -> modified $\lambda$ profile**

- previous results at low $S$ ($S < 10^6$) indicate possible MHD stabilization if $S > S_{crit}$
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