

# Summary of “Full wave simulations for fast wave heating and power losses in the scrape off layer of tokamak plasmas” by N. Bertelli et al.

## Motivation

- Need to understand and minimize RF power losses in the SOL for improving FW performance and compare different devices with different geometry and heating regime

## Key achievements

- Full wave simulations for NSTX/NSTX-U and DIII-D show a direct correlation between the large SOL RF field, the location of the FW cut-off, and the SOL losses (in 2D and 3D)
  - ✓ SOL losses increase significantly as the wave transitions from evanescent to propagating as the density in the SOL increases
  - ✓ Good agreement on the behavior of SOL power losses in NSTX/NSTX-U and DIII-D and consistency with the experimental observations for both devices
- 3D simulations for NSTX show larger SOL losses near the antenna and the LCFS
  - ✓ consistent with the NSTX experiment
- NSTX-U simulations predict a wider evanescent region with lower SOL losses relative to NSTX
  - ✓ favorable for the upcoming NSXT-U experimental campaign
- EAST simulation results strongly differ from NSTX/NSTX-U and DIII-D results
  - ✓ EAST uses a minority heating scheme while NSTX/NSTX-U and DIII-D use high harmonic heating scheme
  - ✓ New simulations are underway to further investigate this last point