HBT-EP is exploring halo currents and effects of ferromagnetic material near the plasma surface

Halo currents

• Halo currents are measured via segmented plasma current Rogowski coils, jumpers between otherwise-isolated chamber sections, and a grounded electrode in the scrape-off layer.

• Halo currents strongly depend on the plasma's major radius, and amplitude and phase of non-axisymmetric magnetic field components.

• Halo currents connecting through the vessel are seen to reach ~0.2% of the plasma current during typical kink mode activity, and ~4% of $I_p$ during disruptions.

• Upcoming machine hardware upgrades will focus on further diagnosing and controlling halo currents.

Ferritic effects

• Ferromagnetic material near the plasma surface is seen to roughly double kink mode growth rates and increase error field sensitivity.