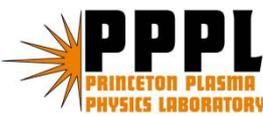




Universität Stuttgart



Magnetic island at low magnetic shear (Ida)

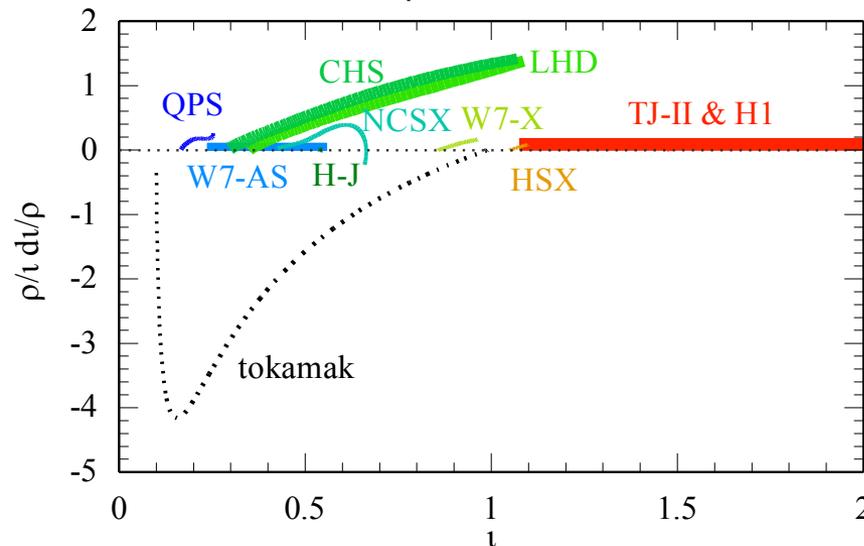
- Bifurcation phenomena of magnetic island (no island \rightarrow stochastization \rightarrow nested magnetic island with interchange mode \rightarrow no island)
- Time scale and critical value of the bifurcation (comparison with theory)
- Cold pulse propagation experiment
- Magnetic island and magnetic shear:
 - ✓ Magnetic island healing ($w=0$) $\rightarrow (r/i)(di/dr)=0.15 \rightarrow$ stochastic island $\rightarrow (r/i)(di/dr)=0.3 \rightarrow$ nested islands (+interchange) $\rightarrow (r/i)(di/dr)=0.5 \rightarrow$ healing

QA

- Flows nearby island, role on this phenomena ? Poloidal flow (E_r) tends to shrink for stochastic island
- (Revisit effect of rational for triggering CERC?), more understanding on co/ctr NBI based eITB
- Time scale \sim skin time
- ι /shear scan with Ohmic current control in TJ-II: quantitative comparison
- \sim Ion banana width, how about in pure ECH plasma ? (no MSE meas.)
- Trial for avoidance of $\iota=1/2$? It appears with NBCD, even it does not exist at vacuum. Flattening of T_e profile is not seen in outward shifted plasma.
- Shear evaluation of “both sides” of rational \rightarrow more information ?

ISHCDB: iota/shear (López-Bruna)

- Contributions from low shear devices (Ascasíbar's talk in ITC/ISHW)



- Where in shear/iota space do we have allowance for optimum confinement?

Objectives

✓ data quality improvement. Local transport analysis can uncover features relating transport and magnetic resonances (e.g. TJ-II).

✓ Find threshold shear that avoids deleterious effect of low order resonances in stellarators/heliotrons. Does this threshold depend on iota-value?



•Tasks

- ✓ Outline for PFR joint paper. Agreed on just expanding Ascasíbar's 6 p contribution to SW. Include H-J (H mode window) and H-1?
- ✓ New contributions
 - ✓ H-J : new TS(in preparation)+SXR data? **No data for shear effect, fast camera (reverse rotation), no transport analysis**
 - ✓ H-1: turbulence/low collisionality?
 - ✓ W7-AS: is there still relevant information in their DB relevant for the topic?
 - ✓ TJ-II: clarify role of resonances on plasma gradients (ECRH). Dynamic configuration experiments.
 - ✓ HSX: $\iota \sim 1$, high order rationals at the edge
- ✓ High shear joint contributions; fill in shear/ ι space (See Ida's talk, this session).

Suggested next steps

- Contribution from high shear device (LHD): plan of ι change exp. (Yamada)
- Isotope effect on scaling (ATF, W7-AS) compared to tokamak scaling
- How E_r couples to island/resonance, ZF and rationals (magnetic topology) (Waltz's simulation). Theoretical contribution: Collisional transport must include complete 3D geometry (e.g. islands).