EX/P4-2 : Investigation of MHD Stability in KSTAR High Normalized Beta Plasmas

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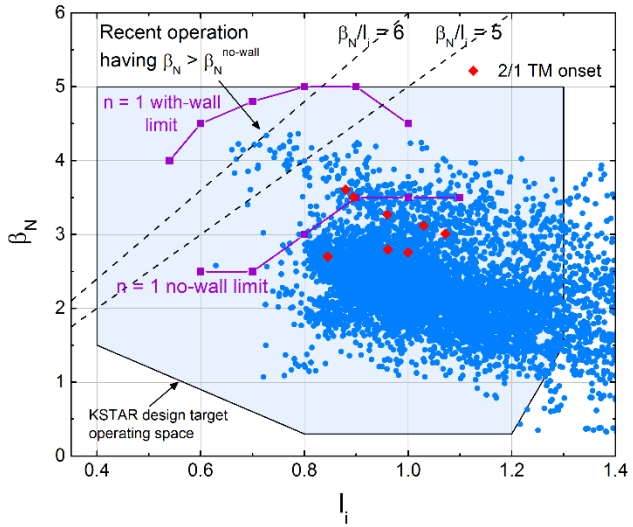
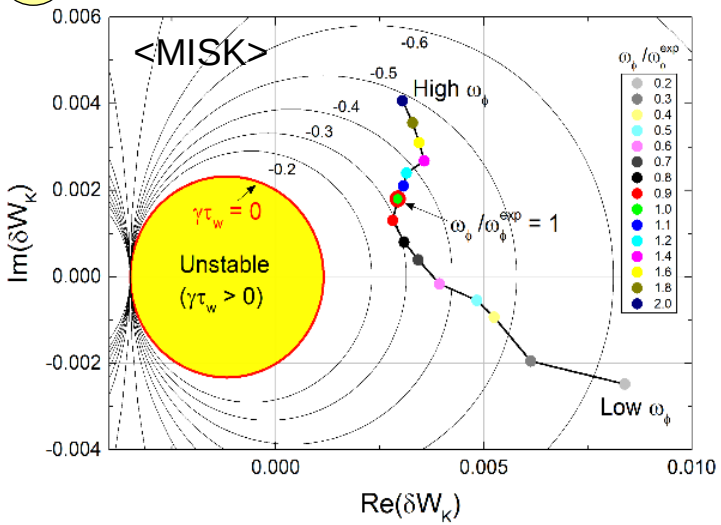
A KSTAR equilibrium operating space exceeding the ideal stability limit



B1 MISK-calculated RWM stability diagram



A. KSTAR H-mode exceeded the n = 1 ideal MHD no-wall stability limit

- High values of β_N up to 4.3 with $\beta_N/l_i = 6.3$
- 60% higher than the n = 1 ideal no-wall limit
- High $\beta_N = 3.3$ sustained for 3 s, longest duration to date

B. Kinetic RWM and tearing stability examined at high β_N

- Kinetic RWM is stabilized by thermal ion precession resonance (MISK code) which agrees with experiment (B1)
- 2/1 tearing mode stability (M3D-C^1 code) is computed to be classically stable which suggests the mode destabilization by pressure effects