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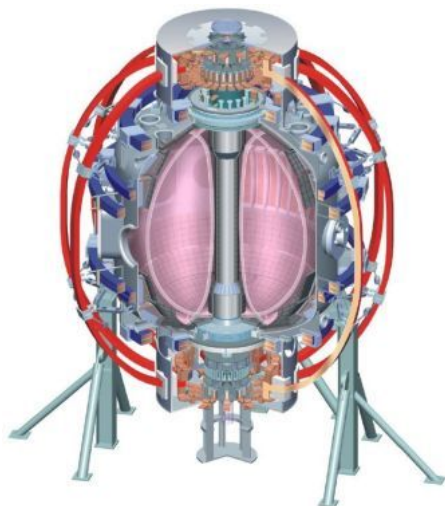
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3D Perturbed Tokamak Equilibria and Importance of Plasma Response

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Outline (I)

- 3D Perturbations in Tokamaks and IPEC # slides
 - How Ideal Perturbed Equilibrium Code (IPEC) works ($\nabla p = \mathbf{j} \times \mathbf{B}$) 1
 - IPEC gives
 - *No islands, shielding currents, and Total resonant field δB_{mn} .vs. External resonant field δB_{mn}^x* 1
 - *No islands, deformed flux surfaces, and Variation of field strength $\delta B_L = \delta B_E + \xi \cdot \nabla B$.vs. δB_E .vs. δB_E^x* 1
- Plasma Response and Locked Modes
 - Error Fields and corrections (NSTX and DIII-D) 1
 - Resolution with the total resonant field
 - *Restored linear correlation between δB_{mn} .vs. n_{crit}* 2
 - *Locking scaling $\delta B_{mn} \propto n_{crit}^{\alpha n} B_T^{\alpha T} R^{\alpha R}$ (NSTX, DIII-D and CMOD)*
 - The Most Sensitive External Field on the boundary
 - *How it looks in terms of $\delta \mathbf{B}^x \cdot \mathbf{n}$ (NSTX, DIII-D, CMOD and ITER)* 1

Outline (II)

- # slides
 - Deformed Flux Surfaces and Non-ambipolar Transport
 - Problems and progresses in NTV theory
 - *NTV in $1/\nu$ and $\nu_{-}\nu^{1/2}$ regimes? $\nu/\epsilon, \omega_E$? (NSTX, DIII-D and ITER)* 1
 - *Generalized NTV, combining $\nu/\epsilon, \omega_E, \omega_B, \omega_b$* 2
 - Discrepancy between theory and experiment can be resolved by
 - *Bounce-harmonic resonances $l\omega_b - n(\omega_E + \omega_B) \sim 0$* 1
 - *Variation of the field strength on the deformed flux surfaces δB_L*
 - Detailed comparison with measured damping profiles (NSTX and DIII-D)?
 - ELM (NSTX and DIII-D)? RMP Optimization (ITER) ? ?
 - Plasma Shielding by Torque, IPEC Extension, and Future Work
 - General model of plasma response by s (energy) and α (torque) 2
 - Interpretation of $n=1$ RFA results (NSTX) and the shielding by $\nabla \cdot \Pi$ 1
 - IPEC extension ($\nabla p + \nabla \cdot \Pi = j \times B$) and future work 1
- 2+14+?