High-n Stability code HINST (N.N.Gorelenkov)

PPPL

HINST is aiming at the analysis of *AEs, KBMs, non-perturbative modes including their destabilization by fast ions.

Physics in HINST, ballooning variable code (tokamak version):

- drive from alphas with FLR, FOW (analytic) and with isotropic slowing down and Maxwellian distribution
- ion, electron Landau damping
- electron collisional damping
- realistic geometry, ESC or VMEC equilibrium
- validated and verified against many experiments and ideal MHD theory, NOVA/NOVA-K codes

Future plans for HINST application to stellarators (2008-..):

- Improve model to include kinetic effects in stellarators
  (ideal ballooning mode results are benchmarked with Nakajima using VMEC)
- Include fast ion drive, generalize the distribution function
- Study Alfven continuum first