Ideal MHD Stability of Axisymmetric Plasmas

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- from recent ARIES-RSX shape studies, it was found that the ballooning and kink stability were degrading beyond an elongation of about 2.4

- using upgraded pressure profile, examine the ideal stability of axisymmetric version of NCSX

- recall that C82 is based on an axisymmetric plasma with $\kappa = 1.8$, $\delta = 0.5$, $q_{edge} \approx 6.0$, and $I_p = 220$ kA

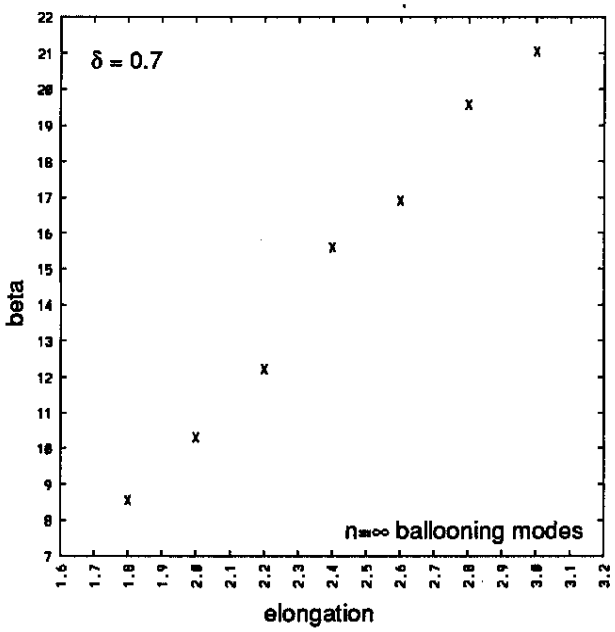
- use following parameters; R = 1.45, a = 0.325, B = 1.0 T

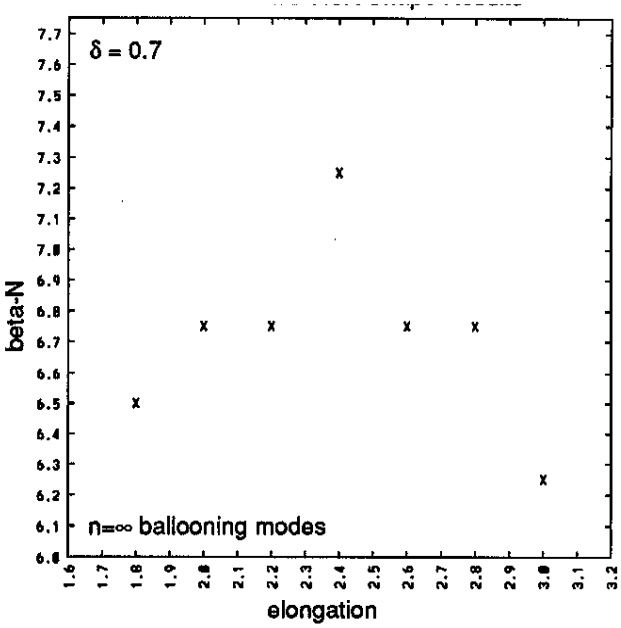
  scan plasma shapes; $\kappa = 1.8$–3.0, $\delta = 0.5$–0.7

  examine $n=\infty$ ballooning and n=1 kink stability

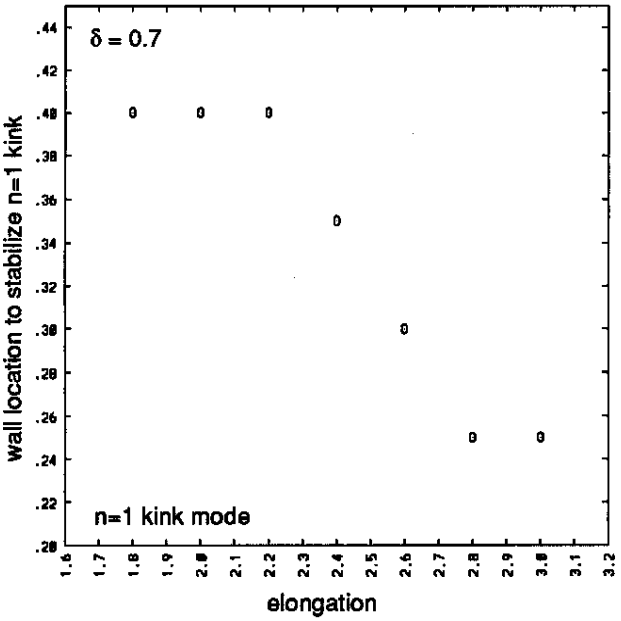
  as elongation is increased, plasma current is increased to keep $q_{edge} = 6.0$ for $\delta = 0.5$ —— I_p is then fixed for that elongation

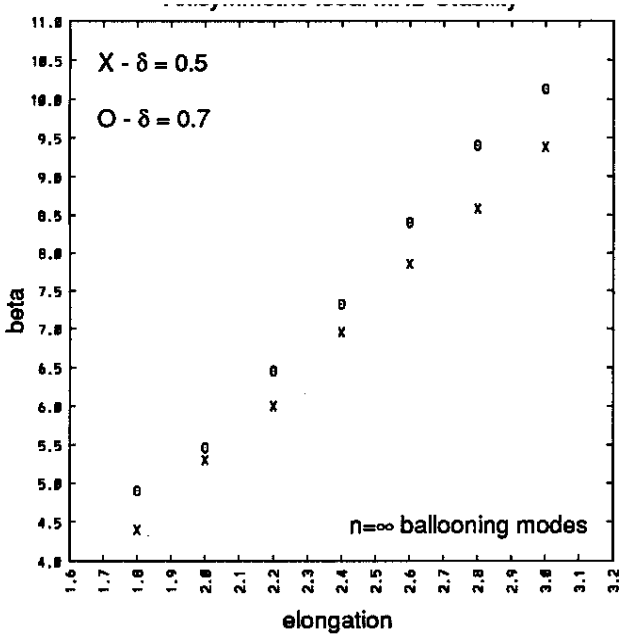
  equilibria are reversed shear with parameters; $q_o = 5.0$, q_{min}=4.4–4.6, and $r(q_{min}) \approx$ fixed

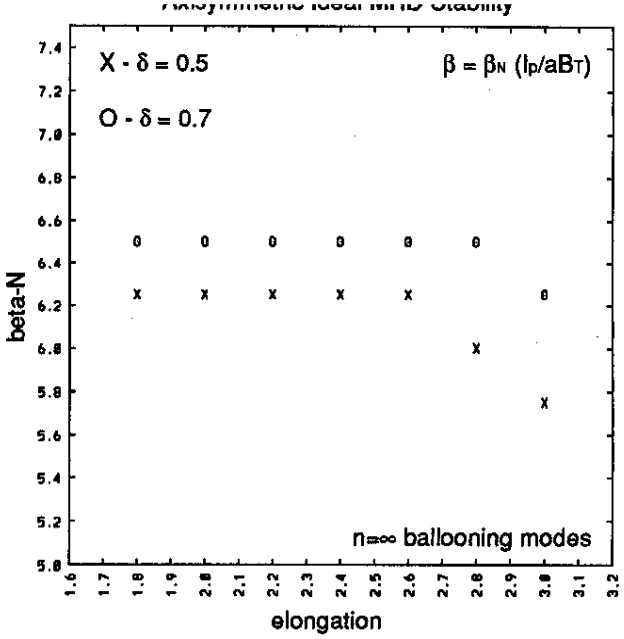




Recent ARIES-RSX Shape Results







kink stability pending convergence problems