

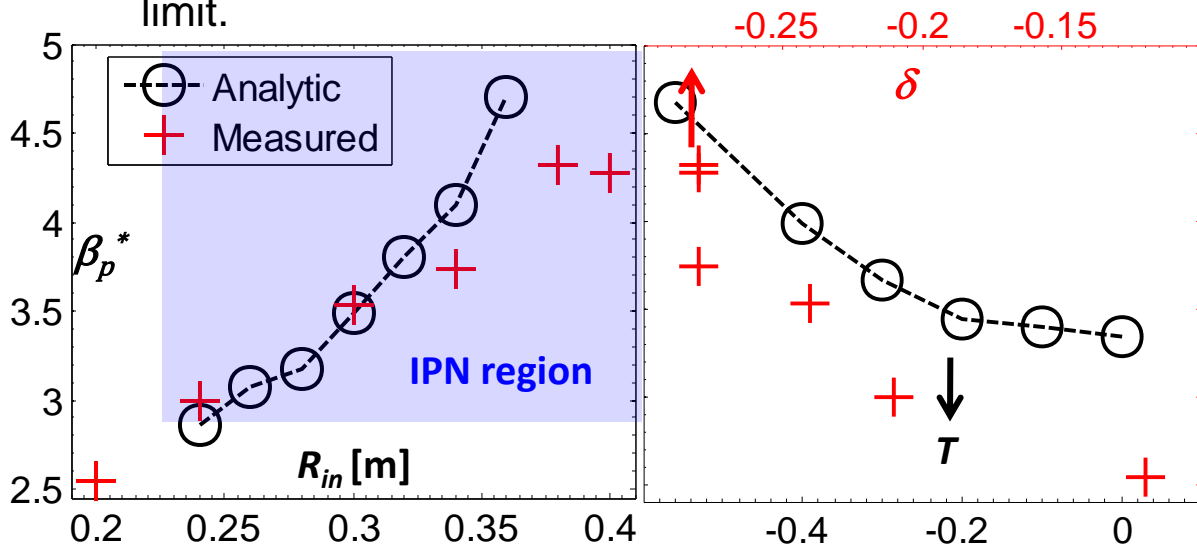


An analytical description of high β_p equilibrium with

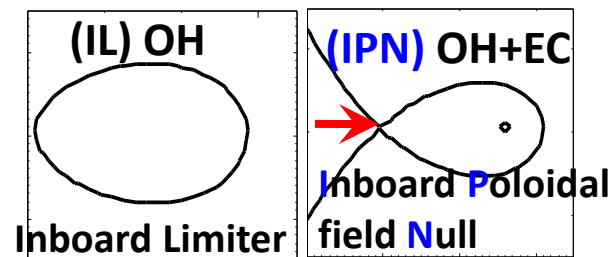
Negative Triangularity in QUEST [Kishore Mishra]



- ❑ In QUEST spherical tokamak, **negative triangular** plasma equilibrium is **self organized**, naturally at high β_p ($\varepsilon\beta_p \sim 1$) during **ECRH injection in Ohmic plasma** at fixed plasma current.
- ❑ As β_p is increased, plasma shape becomes **more negatively triangular** with formation of a **natural poloidal field null** at the high field side (IPN plasma).
- ❑ **No external shaping coils** are used to enhance the negative triangularity (δ).
- ❑ A simple analytical solution of Grad-Shafranov equation is used to investigate such equilibrium.
- ❑ The model is in agreement with the experimental results that
 - At a **critical β_p^*** ($\beta_p + I/2$) ~ 3 , IPN configuration is formed ($R_{in} > 0.22\text{m}$)
 - With **decrease in δ , β_p^* increases.**
 - Negative triangularity is **a new feature of plasma self organization** near equilibrium limit.



Variation of β_p^* with R_{in} , triangularity (δ) and triangularity parameter (T in model) for EC heated Ohmic plasma in QUEST



Natural transition of equilibrium at high β_p in EC heated Ohmic discharge