

ARIES-CS Configuration Development Plan
Summary discussion at ARIES-CS Meeting 5/7/03
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Working Configuration

- Raise B-field of NCSX-8m to make it self-consistent
(LPK': $R = 8.25$ m, $\beta = 4.1\%$, $B = \sim 6.5-7.0$ T, $P_{\text{fus}} = 2$ GW), or...
- Move to larger size to gain margin in coil-plasma spacing:
(JFL: $R = 9.68$ m, $\beta = 4.1\%$, $B = 5.7$ T, $P_{\text{fus}} = 2$ GW), or...

Physics Configuration Design

- Explore coils for new configurations with attractive alpha confinement.
 - Explore Modular / TF / PF coil tradeoffs.
- Examine sensitivity of alpha loss to beta.
- Estimate local alpha particle and heat fluxes.
- Examine magnetic surfaces (fixed-boundary).
 - Look for equilibrium beta limits.
 - Discussion: implications of β exceeding linear instability thresholds?
- Explore QH and drift-optimized configurations.

Engineering

- Examine P. Garabedian's 2-period configuration.
- Examine higher-field feasibility (6 – 8 T)
- Provide a COE figure of merit to guide configuration design.
Function of β , B, R, R/a, R/? coil-plasma.
- Engineering criteria for optimizer: for maintenance, blankets, magnet.
- Divertors: wait for further progress on NCSX modeling of heat loads. (next year).