FESAC TAP: Spheromak

S. Woodruff

- Some of us have submitted separate panel question answers - please find them online.
- We think that the spheromak is a configuration that is closely related to the rfp and tokamak
- There is a cost effective path to address CE and POP level issues.

We (SW, CRS, HSM) have uploaded another response to the questions with some additional details and perspectives

Similarities/Differences:

Q1. Goal is the same.

Q2. Scientific issues are the focus of our time-line (rather than devices)

Q3. Modeling perspective differs; we have more on the importance of rfp research to spheromak research; methodology for addressing current drive differs

Q4 + Q6. Spheromak performance metrics that we used in the 15-pager are explained in terms of more general physical parameters, and summarized as a table.

Q5. Near term scientific issues are incorporated into a *roadmap* to help guide decision-making.

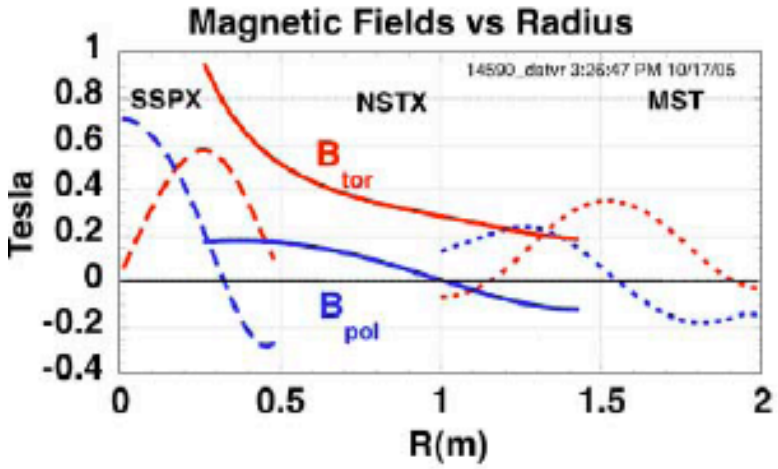
Q7. Computational and experimental plans are outlined for addressing ß limits

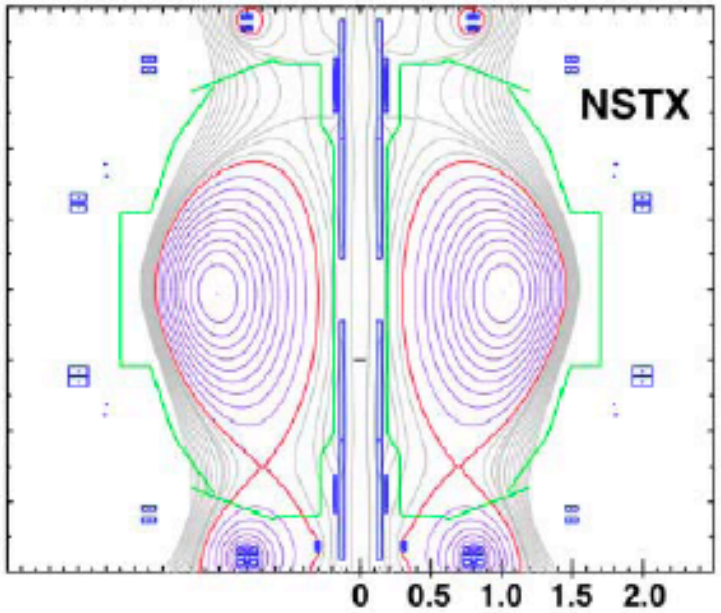
Q8. Electrodes - similar responses.

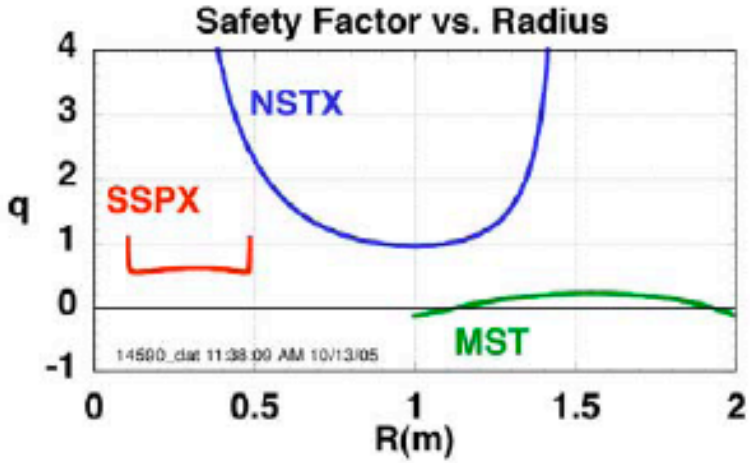
Q9. Quite different responses: we would like to have more control of major parameters, and have some suggestions about moving and upgrading SSPX to do that.

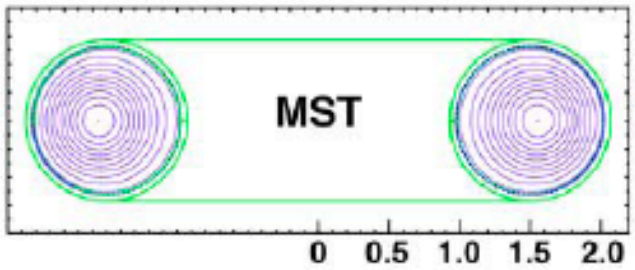
Q10. HSM contributed the same table to both reports.

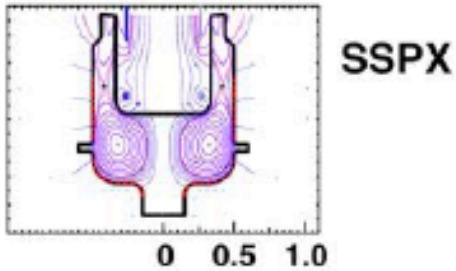
Spheromaks: configuration intermediate between ST and RFP











In particular, I would like to draw attention to a cost effective path forwards for spheromak research at the CE/POP level

An upgrade to the SSPX facility would give the most cost effective means for addressing CE and POP-level issues.

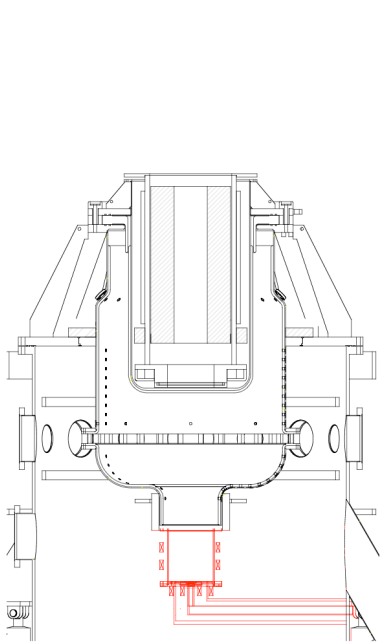
Current drive issues could be addressed by the addition of a 2nd gun.

Confinement and beta limits could be explored in detail by adding a rod down the middle to adjust q-profile for stability experiments and decouple I_p from B_t for I/aB scaling.

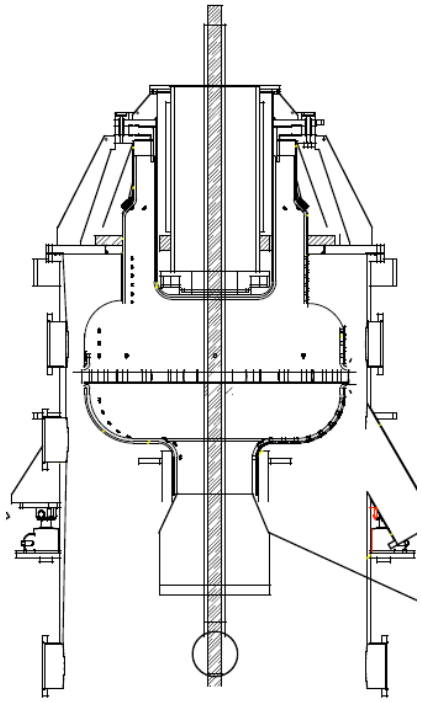
Replacing inner electrode with a resistive wall would give control over injected flux.

Larger flux conserver would provide size and Lundquist scaling data.

Evolve to long pulses (and coils).



CE current drive



Full POP

(utilizing existing equipment)

Summary

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