Power and Particle Control

NCSX

Status December 2000

NCSX Boundary Group

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NCSX Project Meeting

December 19/20 - 2000

Phased Approach

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In the final phase, the goal is optimized power handling combined with effective neutrals and impurity control

- **This will likely require a set of appropriately shaped divertor baffles and divertor pumping** *(similar to W7-AS)*
- **However, with our present limited knowledge of the boundary configuration, implementation of a highly optimized divertor system would be a high risk**
- **Therefore, for the initial phase, we will design a system which is likely not optimal, but has higher configurational flexibility**
- **At the same time, the vacuum vessel and plasma configuration need to have enough flexibility to accommodate an advanced plasma boundary system at a later phase**

Phase-I Plasma Boundary System

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1. Set of three modular, movable limiters, able to handle 6 MW for 0.5s and expandable to longer pulse lengths (1s ... 5s)

   At this time generic design; specific shape and location to be determined in the near future (need to calculate footprints on control surface in Jan 2001)

2. Wall armor for protection against energetic particles and NBI (e.g. 25% of wall surface)

   (shaped CFC sheets or standard graphite tiles)

3. Wall conditioning system: He and H glow discharge, boronization, Li evaporation system

Exit Points of Fast Particles on the LCMS

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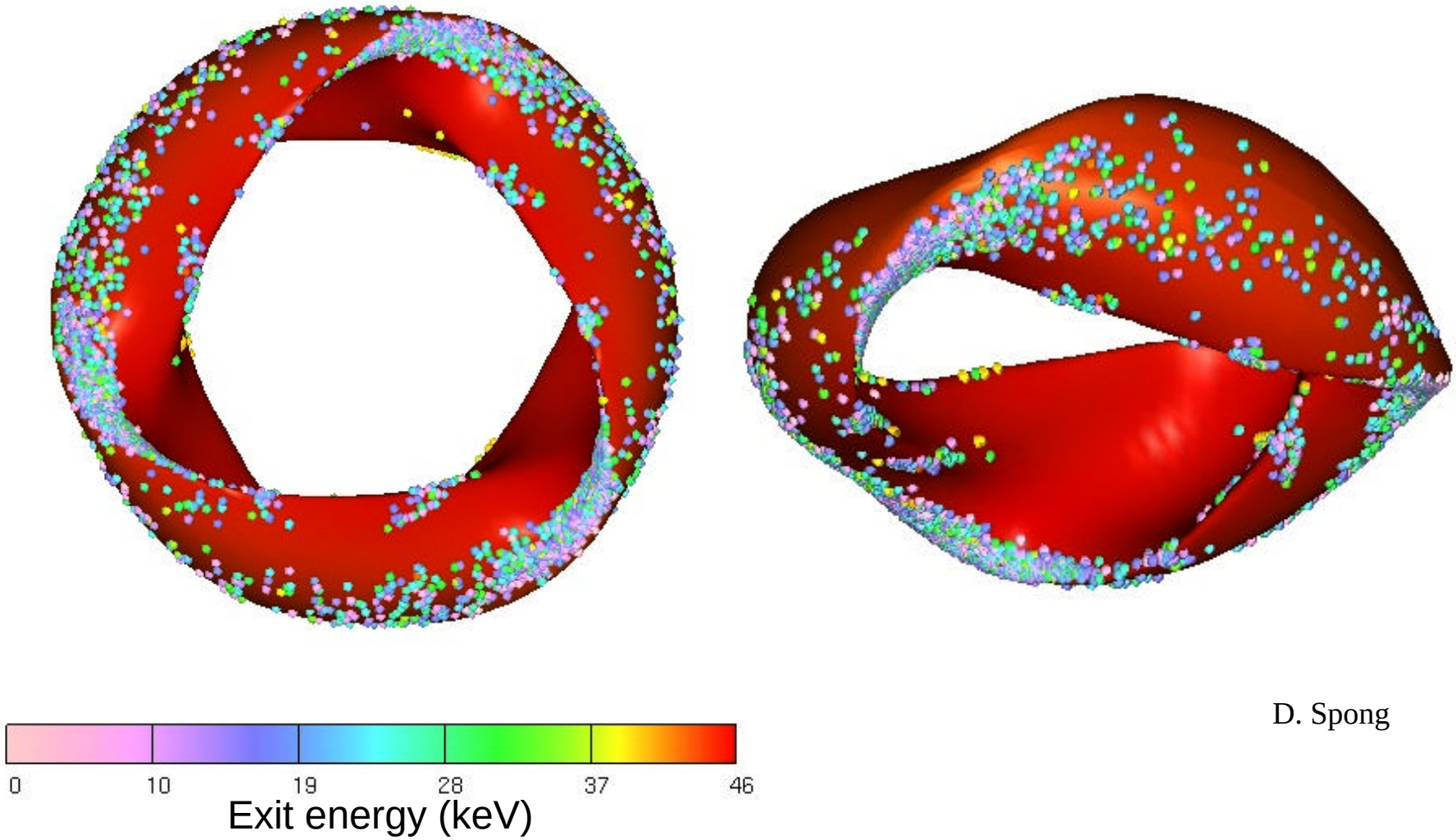

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Energy and Spatial Distributions of Lost Beam Particles on QA 383

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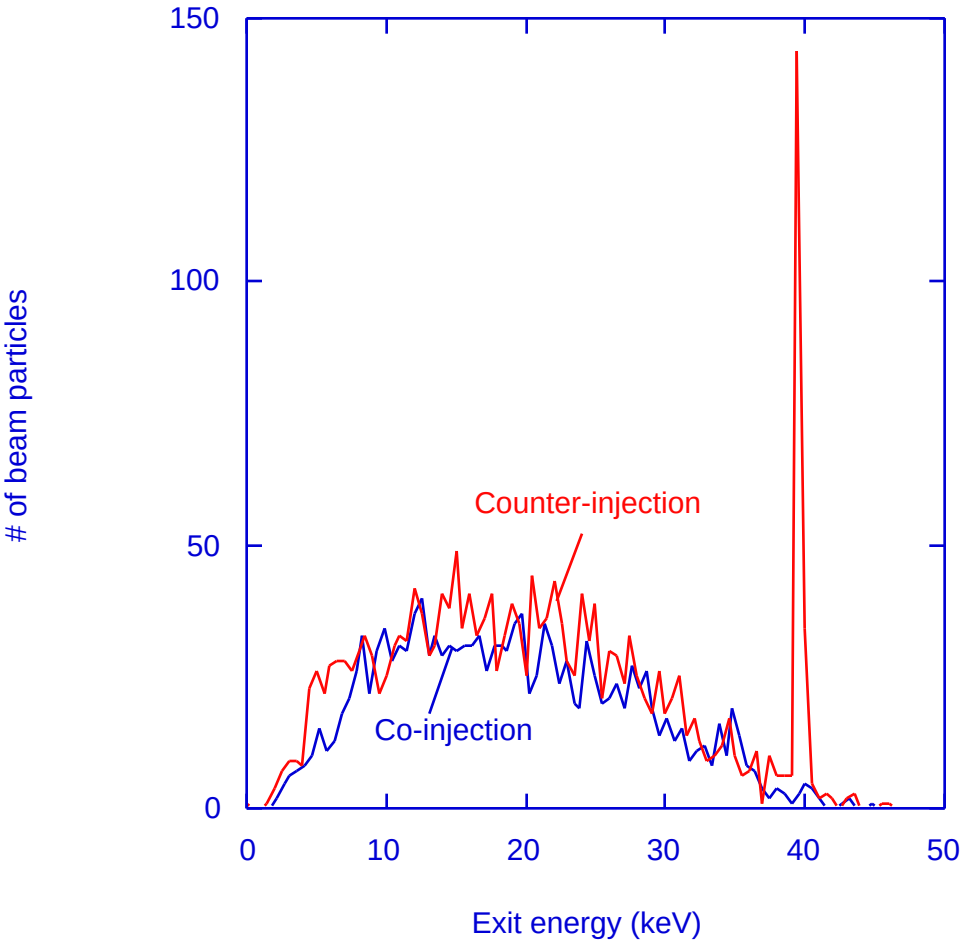

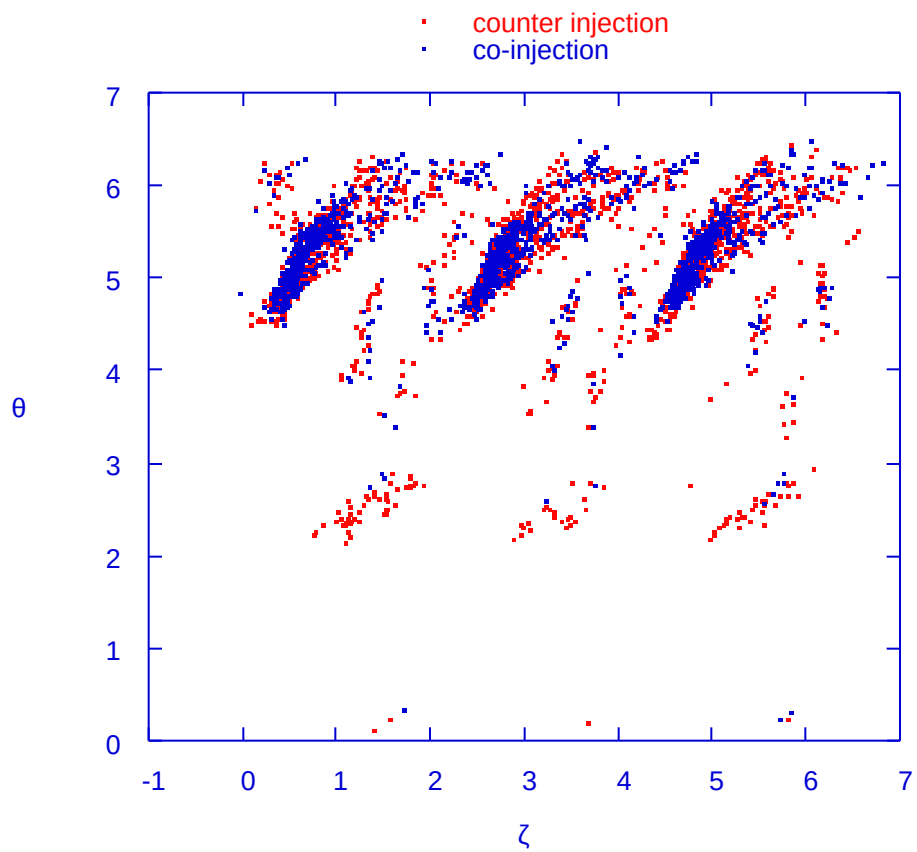

(flux-surface coordinates)

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Exit Energies of Fast Particles

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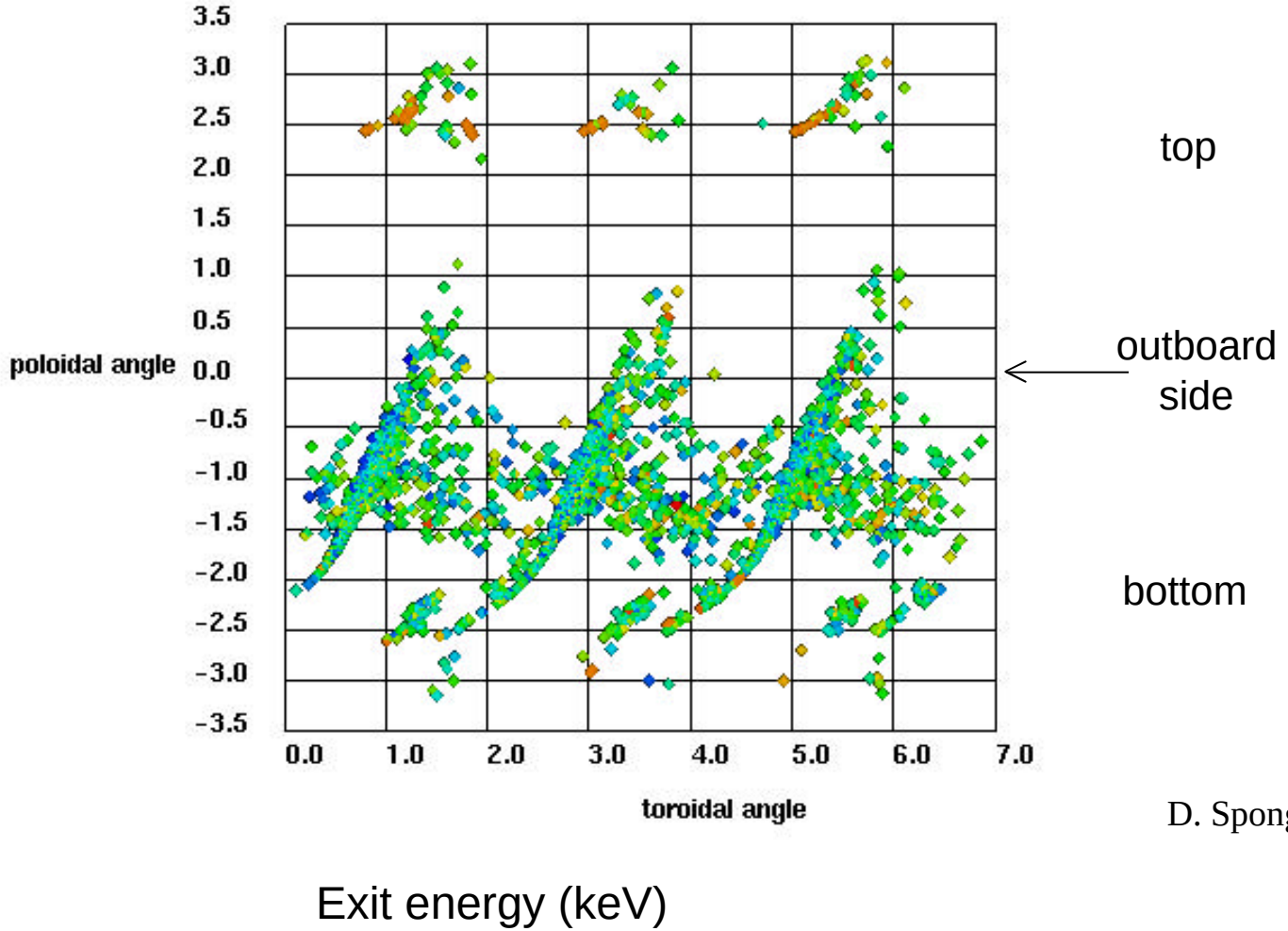

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Fast Particle Exits on the LCMS and Wall Armor (in Real-Space Coordinates)

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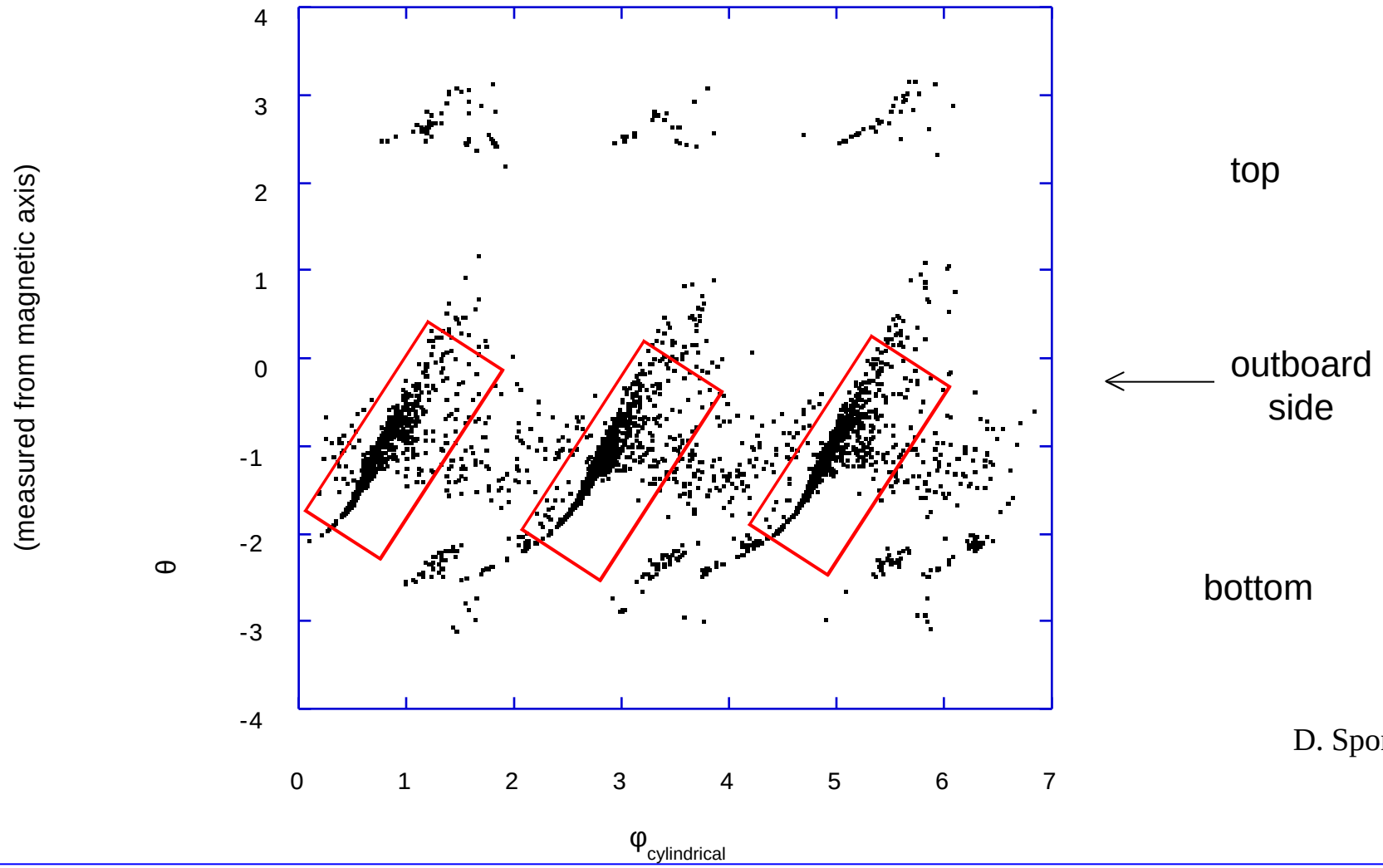

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