

Abstract Submitted
for the DPP02 Meeting of
The American Physical Society

Sorting Category: 5.6.2 (Experimental)

Shaping in DIII-D: The Reference Flux Constraint¹

A.W. HYATT, J.A. LEUER, J.T. SCOVILLE, M.L. WALKER, General Atomics — Poloidal magnetic flux from DIII-D's field shaping coils can be separated into two parts: a constant "reference" flux across the plasma cross section, and a spatially varying part that provides plasma shaping. The reference flux represents Ohmic current drive supplied by the shaping coils and is not constrained by shaping considerations alone. DIII-D operates with a subset of the shaping coils connected in parallel across two common busses with some coil(s) unpowered. This configuration forces the unpowered coil(s) to carry the return current and constrains the reference flux which otherwise could drift even while maintaining the desired plasma shape. But this method of constraint: (a) is more or less incompatible with most plasma shapes and (b) forces some of the coils power supplies to buck the buss voltage needed to drive the return current, which leads to command saturation and degradation of shape control. Methods of operating without this hardware constraint and the many benefits this would bring will be discussed. Preliminary results from such operation will be presented.

¹Work supported by US DOE Contract DE-AC03-99ER54463.

- Prefer Oral Session
 Prefer Poster Session

A.W. Hyatt
hyatt@fusion.gat.com
General Atomics

Special instructions: Poster 9, Stability

Date submitted: July 19, 2002

Electronic form version 1.4