

Abstract Submitted
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A new hybrid inductive scenario for a nearly steady-state Reversed Field Pinch¹ J.S. SARFF, University of Wisconsin-Madison — Steady-state current sustainment is challenging for the Reversed Field Pinch (RFP). The current magnitude is large, while the pressure-driven (bootstrap) current is small, even at the RFP's high beta >20%. In the TITAN (RFP) system study [1], the current was designed steady-state using Oscillating Field Current Drive (OFCD), i.e., steady magnetic helicity injection using phased AC induction. Experiments and theory for OFCD are so far promising, but OFCD's reliance on magnetic relaxation could turn out incompatible with energy confinement requirements. Meanwhile inductive current profile control has demonstrated tokamak-like confinement in the RFP. Such control is inherently not steady-state. A hybrid scheme is proposed using OFCD to ramp the current, followed by a pulsed-burn during which inductive profile control maintains high confinement. The current is not constant but never goes to zero (sawtooth-like waveform). The current drive (and profile control) is efficient induction, simply applied at the plasma surface. The pulsed-burn phases could be separated by only a few seconds. Optimization of the hybrid cycle and other issues will be discussed.

[1] <http://aries.ucsd.edu/LIB/REPORT/TITAN/final.shtml>

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John Sarff
University of Wisconsin-Madison

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