

Abstract Submitted  
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**A proof of principle spheromak experiment: The next step on a recently opened path to economical fusion power** THOMAS JARBOE, GEORGE MARKLIN, BRIAN NELSON, DEREK SUTHERLAND, University of Washington, HIT TEAM TEAM — A proof of principle experiment to study closed-flux energy confinement of a spheromak sustained by imposed dynamo current drive is described. A two-fluid validated NIMROD code has simulated closed-flux sustainment on a stable spheromak using imposed dynamo current drive (IDCD), demonstrating that dynamo current drive is compatible with closed flux. (submitted for publication and see adjacent poster.(spsap)) HIT-SI,  $a = 0.25$  m, has achieved 90 kA of toroidal current, current gains of nearly 4, and operation from 5.5kHz to 68 kHz, demonstrating the robustness of the method.(spsap) Finally, a reactor design study using fusion technology developed for ITER and modern nuclear technology shows a design that is economically superior to coal.(spsap) The spheromak reactor and development path are about a factor of 10 less expensive than that of the tokamak/stellarator. These exciting results justify a proof of principle (PoP) confinement experiment of a spheromak sustained by IDCD. Such an experiment ( $R = 1.5$  m,  $a = 1$  m,  $I_{\text{tor}} = 3.2$  MA,  $n=4e19/m^3$ ,  $T = 3$  keV) is described in detail.

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