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A mechanism for the dynamo terms to sustain closed-flux current, including helicity balance, by driving current which crosses the magnetic field THOMAS JARBOE, BRIAN NELSON, DEREK SUTHERLAND, University of Washington — Recent experiments on HIT-SI demonstrate sustainment with ideal MHD stability, a major breakthrough in spheromak sustainment. The lack of large reconnection events demands a reassessment of the need for reconnection for sustainment. An analysis of imposed dynamo current drive (IDCD) [T.R. Jarboe *et al.,* Phys. Plasmas 22, 072503 (2015)] reveals: a) current drive on closed flux surfaces seems possible without relaxation, reconnection, or other flux-surface-breaking large events; b) the scale size of the key physics may be smaller than is often computationally resolved; c) helicity can be sustained across closed flux; d) and IDCD current drive is parallel to the current which crosses the magnetic field to produce the current driving force. In addition to agreeing with spheromak data, IDCD agrees with selected tokamak data.

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