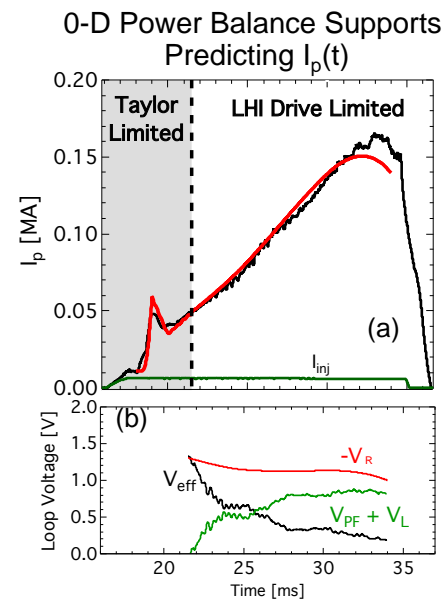
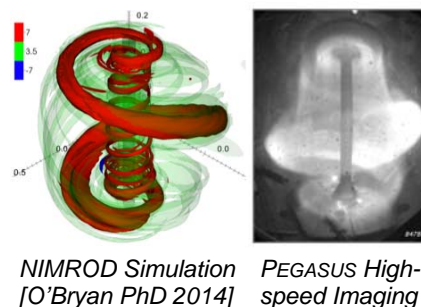




Fonck *et al.*, OV/5-4: H-mode and Non-Solenoidal Startup in the Pegasus Ultralow-A Tokamak

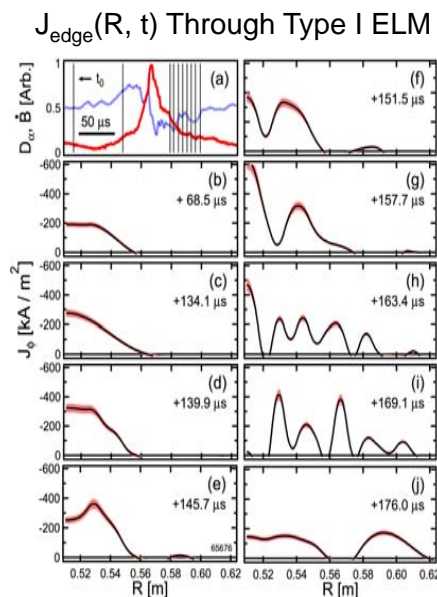
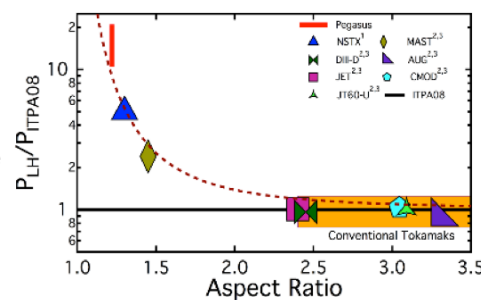
Scientific Quality: Recent Achievements

- Non-solenoidal startup via Local Helicity Injection
 - $I_p = 0.18$ MA for injected $I_{inj} = 6$ kA
 - Power balance model for predictive $I_p(t)$
 - Resistive MHD simulation: current generation mechanism = reconnecting helical current streams
 - Provides access to stable $I_N \geq 10$ regime
- H-mode and ELM characteristics at $A \sim 1$
 - Ready access to H-mode via ohmic heating only
 - P_{LH} threshold increases rapidly as $A \rightarrow 1$
 - Detailed $J_{edge}(R,t)$ measured through ELM cycle



Relevance to Fusion Energy: Critical Issues Addressed

- Localized Helicity Injection
 - Non-solenoidal startup capability eliminates need for central solenoid
 - Startup hardware removable before nuclear phase
 - $J_{edge}(R,t)$ modifier for edge plasma control
- Advanced tokamak physics
 - Access to detailed nonlinear dynamics of H-mode edge
 - Potential access to high I_N, β_T regime @ $A \sim 1$



Supporting Comments: Next Steps

- Near-term emphasis on predictive understanding of Helicity injection startup for application on larger facilities (NSTX-U)

