Development and Experimental Qualification of Novel Disruption Prevention Techniques on DIII-D

- **DIII-D Disruption Free Protocol:**
  - *Initiative for qualifying comprehensive disruption prevention tools in DIII-D*
- **Novel real-time proximity-to-Instability controller for avoidance of stability limits**
  - Applied for robust VDE prevention
- **Novel soft-landing technique generates warm, helical core after thermal quench**
  - Significantly slow current quench
- **Rigorously qualifying emergency shutdown for disruption avoidance**
  - Transitioning to limited for emergency shutdown significantly improves chances of success