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Issues and Solutions for Implementation of a Nanoparticle Plasma Jet Diagnostic on DIII-D[1] J.R. THOMPSON, I.N. BOGATU, FAR-TECH, Inc. — For ITER, runaway electron (RE) beams are considered a critical problem. Moreover, RE beam dynamics involves processes not yet fully understood or precisely diagnosed. FAR-TECH has proposed using a C_{60}/C plasma jet as a novel diagnostic probe for RE beam-plasma interaction on DIII-D. The existing FAR-TECH prototype plasma jet system is expected to deliver up to ∼75 mg C_{60}, at ∼4 km/s, and within ∼1 ms of triggering, resulting in a free and bound electron density ∼2.4x10^{21} m^3, about 60 times larger than the typical DIII-D pre-disruption operation value. Implementation of a 100 kJ pulsed power plasma jet system is non-trivial, with electromagnetic interference (EMI) and safety being two major issues. Microsecond timescale, high current drivers generate significant EMI from which other DIII D systems need to be shielded. Safety issues associated with high voltage and potential capacitor failure must also be addressed. We will present the status of our investigation into the principle solutions for the critical issues involved in the implementation of FAR-TECH's prototype C_{60}/C plasma jet system on DIII-D.

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