3E.1 Defect-Assisted Safe Operating Area Limits and High Current Failure in Graphene FETs" by Nagothu Karmel Kranthi, Abhishek Mishra, Adil Meersha, Harsha Variar and Mayank Shrivastava, Indian Institute of Science

In this work, a unique measurement setup, involving integration of transmission line pulse tester with Raman spectrometer (see Figure), is used to investigate the pulsed safe operating area (SOA) boundary of graphene field effect transistors (GFETs). Physical insight into various SOA boundaries, i.e., near-electrical, electro-thermal and thermal, is given. Unique defect-assisted degradation in channel and its correlation with the carrier transport as well as failure is revealed, with the help of electrical as well as Raman spectroscopy based investigations during well controlled pulse-stressing of GFETs. The SOA and power to fail dependency on carrier concentration and nature of carrier transport is addressed.