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X-Ray Induced Breakdown in Air at High Reduced Electric Field: Experimental Details[1] ROBERT VIDMAR, ANUSHA UPPALURI, University of Nevada, Reno — Breakdown of laboratory air in parallel plate geometry was triggered by an X-ray pulse originating from an electron beam source. The electron beam operates at 100 keV and a few mA for a few hundred ns to several ms. The source is shielded with stainless steel and lead from the breakdown n device. Theory is presented relating the X-ray count rate in a NaI(Tl) crystal to the volumetric ionization rate in air. Measurements quantify the X-ray count rate in a detector and provide an estimate of the volumetric ionization rate during an X-ray pulse. An air-chemistry code provides a time history of electrons and air species leading up to breakdown in air subject to high reduced electric field. Measurements are made with a parallel plate geometry biased to near breakdown. X-ray emissions serve as the source of ionization resulting in breakdown. Details of the method and measurements are discussed.

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