



Search for relativistic electrons in laboratory discharge experiments

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Discharge experiments were carried out at the Technical University of Eindhoven in 2013. The experimental setup was designed to search for electrons produced in meter-scale sparks using a 1 MV Marx generator. Negative voltage was applied to the HV electrode. Five thin (1 mm) plastic detectors (5 cm² each) were distributed in various configurations close to the spark gap. Earlier studies have shown (for HV negative) that X-rays are produced when a cloud of streamers has developed 30-60 cm from the negative electrode. This indicates that the electrons producing the X-rays are also accelerated in this location, probably in the strong electric field from countstreaming streamers of opposite polarity. Comparing our measurements with modeling results we find that 200-400 keV electrons produced about 30-60 cm from the negative electrode is the most likely source of our measurements.