

HIGH VOLTAGE SUBNANOSECOND CORONA INCEPTION

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Corona discharges caused by ultra-fast pulses are of concern in systems that create and radiate these pulses. Corona discharge in these systems can have adverse effects such as pulse reflection, phase dispersion, and significant power losses. We have experimentally observed corona development and discharge in this type of environment under several conditions. E-field, gas pressure and pulse repetition rates have all been varied and the resultant corona observed. Several gas dielectrics, including air, SF₆, and admixtures of SF₆ and N₂ have been used. Applied pulse characteristics vary from 10 to 300 kV, 0.3 to 1.5 nsec risetimes, 1 to 100 nsec FWHM, and rep-rates from single shot to 5 kHz. Both coaxial and point-plane geometries are used in the test gap. Observations of the corona inception are made with a streak camera and an image intensifying CCD framing camera. The streak camera provides information on corona development of a single pulse, while the CCD framing camera provides an integrated image of the ionized region during a series of pulses.

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