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**Volt-Ampere characteristics and the anatomy of gas discharges**
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— We are presenting time resolved recordings of the spatial profile (radial and axial) of cylindrically symmetric discharges recorded by ICCD camera. These pictures are closely associated with temporal development of voltage and current. Volta-Ampere characteristics are recorded in order to test the pd, $jd^2$ and E/N scaling in such discharges and we have performed measurements both and standard, cm size discharges and for micro discharges. Most importantly we have recorded carefully the area of the discharge in order to make proper normalization of the total measured current into current density j. The proper breakdown voltage versus current density normalized by the square of the gap length characteristics is obtained where entire glow discharge is a single point as expected by the basic phenomenology. This has never been directly proven by measurements. We have also found that the Paschen curves and Volt- Ampere characteristics hold well, if properly normalized down to 200 micro meters. We have also found several modes, presumably associated with spatial profiles in hollow cathode and even in parallel plate discharges when radial dimension exceeds the mean free path by a large amount. We have also found evidence that flat Paschen curves recorded to the left of the minimum are in some cases due to the long path breakdown. This work was funded by project 155 of the Serbian Academy of Sciences and arts.

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