

# An Improved Pulsed Electroacoustic System for Space Charge Measurement under AC Conditions

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In this paper, an improved space charge measurement system based on the pulsed electro acoustic technique (PEA) is presented. The new system gives an essential way to examine the role of space charge in electrical aging process under AC conditions. The system setup for AC measurement is presented and detailed in this paper with comparison to the old system. There are two features with improved PEA system. A pulse generator with a 3 kHz repetition rate is utilized to reduce the measurement time. The Eclipse data acquisition system is used to achieve the high data acquisition rate. The results which were taken from both old and new PEA system show that hetero-charge can be formed in the region close to the lower electrode under AC electric field. Apparently the results captured from the new system have better phase resolution than the old system. The space charge decay profile measured by the new system can reflect vividly on the charge dynamically changing. The utmost space charge information was saved as the measurement time was dramatically shortened by the improved system.

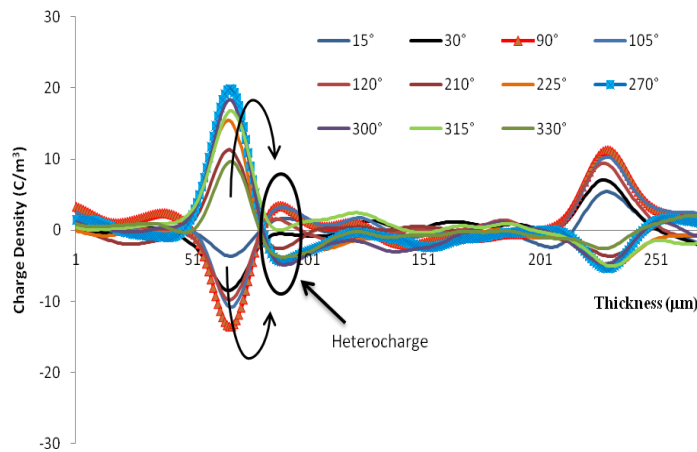


Figure 1: Space charge profile under AC condition,  $f=1\text{Hz}$ , every  $15^\circ$  in one cycle.

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