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RF Currents Produced from AC Arcs with Asymmetric

Shea, J.J., Xin Zhou

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2010 Proceedings of the 56th IEEE Holm Conference on Electrical Contacts > 1 - 11

Abstract

The RF current (0-20MHz) produced by an air arc with asymmetrical (graphite-copper) electrodes was investigated for 120Vac 60Hz over a current range of $1.2A_{rms}$ to $45A_{rms}$. Time resolved spectral signals of measured RF currents showed amplitude dependence on 60 Hz arc current level, voltage polarity, electrode material, and circuit impedance. For most conditions, RF currents were measured only when the copper was the cathode. It was hypothesized that the formation and extinction of cathode spots was likely the source for the measured RF current with a low level contribution from ion oscillations. A model was developed that showed how graphite, transferred to the copper electrode, could create RF currents leading to

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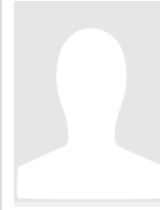
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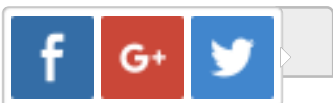
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