DESCRIPTION OF ELECTRICAL ACTIVITY

Three different categories of electrical activity were recorded during the arcing experiments. They were scintillations, flashing and strong arcing. Each of these activities developed a unique visual and oscillograph signature.

Scintillation

Scintillations were the first electrical activity that was observed during the experiments. Visually, they began as pinpoints of light that flickered at the edge of the pre-damaged cracks in the insulation (Figure 10). As time went on and a char track built up on the insulation, the flickers of light appeared at various places along the path between the pre-damaged cracks. During the more lively scintillations an electrical buzzing or crackling sounds could be heard. No scintillations caused a circuit breaker to disrupt power.

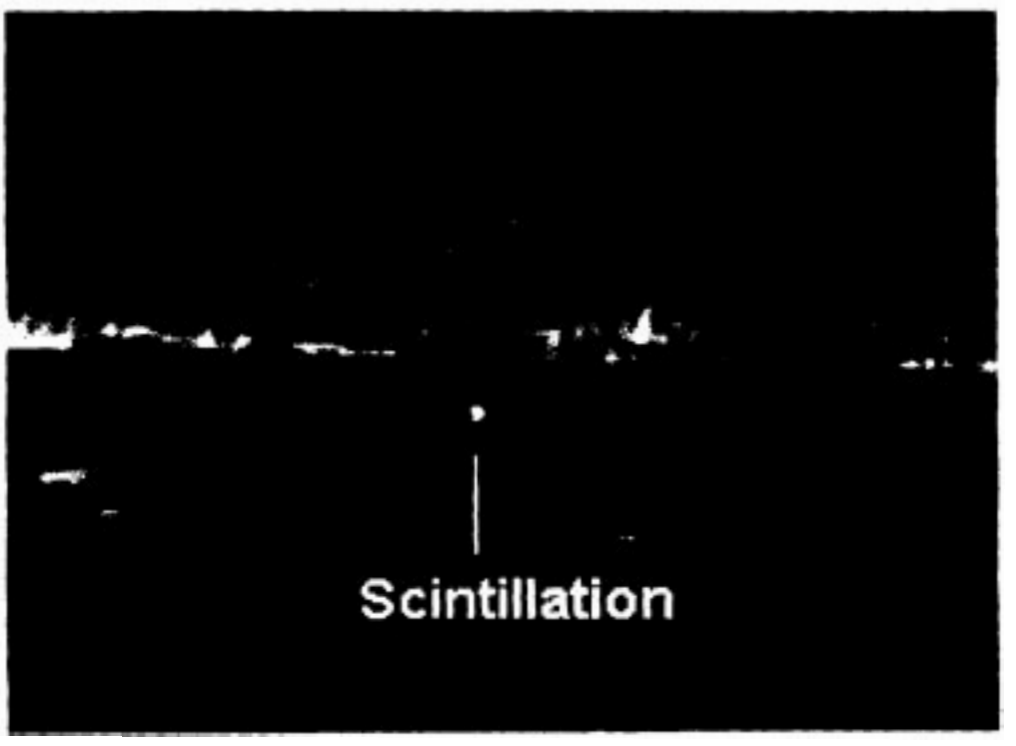

Figure 10. Scintillation at the edge of a pre-damaged crack.

An oscillogram of scintillations (Figure 11) showed them to be high fiequency events which distorted the current and voltage waveforms. The frequency components appear to be greater than 1 megahertz. Quantitative measurements at these frequencies require the inductances and capacitances of each of the components of the circuit (i.e. generator, circuit resistors, oscilloscope etc.) to be measured and analyzed which was not in the scope of this work. Energy transfer between wires cause voltage distortions (noise) and this process caused changes to the insulation as a char path was built.