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
Low Frequency Dispersion in Non-conducting Contacts in Humidity

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Abstract: To develop an enhanced understanding of an aspect of the charge transport mechanism in systems composed of solid-solid insulating contacts, the dynamic dielectric response of sand grains and of silica-silica rod contacts was investigated at dry and at 97% relative humidity (RH), in the frequency range 10^{-2} to 10^5 Hz. In dry atmosphere no appreciable amount of conductivity is observed, while in humidity the response follows a strongly dispersive behaviour. Sharp rise in capacitance gives a clear evidence for the storage of charge in the transport process. Collectively, the conductance of the sand grains increases super-linearly with the number of contacts suggesting filamentary conduction paths. The conductance G of the silica-silica contacts varies almost inversely with the number of contacts pointing towards a uniformly distributed conduction mechanism. It is found that the conduction process, despite a reduction in the geometrical area at the point of contact, is not significantly limited at the interface between the connecting surfaces.

Key Words: Surface transport, dynamic response, silica-silica contacts, filamentary conduction.

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