Abstract Submitted
for the GEC16 Meeting of
The American Physical Society

Net Emission Coefficients for Copper and Iron Plasmas FRANK KASSUBEK, ABB Corporate Research, Baden-Dättwil, Switzerland, ODED ZILBERBERG, ABB Corporate Research, Baden-Dättwil, Switzerland; ETH Zürich, Institute for Theoretical Physics, CHARLES DOIRON, ABB Corporate Research, Baden-Dättwil, Switzerland — Radiative heat transfer is an important mechanism for heat transport in electrical arcs, e.g. in electrical switchgear. An exact description of this phenomenon is important (i) for the energy balance of the arc itself, and (ii) for the estimate of the escaping radiation that leads to evaporation of polymer nozzles; the evaporated material and its flow have a strong effect on the arcs. For low voltage arcs, the plasma composition within the arc is dominated by the contact material. In the present study, we compare copper and iron. Especially, we discuss the calculation of absorption and emission spectra and their characterisation by net emission coefficients. The latter describe well the effective power balance at the centre of the arc. We show that in addition to the net emission coefficients, it is important to characterise the radiation that is emitted from the arc core.

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Date submitted: 09 Jun 2016 Electronic form version 1.4