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Mitigation of High Field Corona Losses by Surface Treatments

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We are applying our understanding of vacuum arc mechanisms by attempting to mitigate coronal losses on high voltage transmission line conductors. These losses seem to involve field emission and occur at surface fields around 20 MV/m. The results of high-voltage tests on the corona discharge in the conditions of simulating the rain of samples of aluminum wire of grade AC 300/39 coated with high-temperature alumina α -Al₂O₃ modified with graphene oxide and carbon nanotubes are presented. A significant effect is shown of up to 40% of the decrease in the power loss to the corona due to the hydrophilic properties of the coating.

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