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Modification of the local electric field around a sharp corner due to surface conductance HSIEN-HUNG WEI, National Cheng Kung University, DAVID HALPERN, University of Alabama — It is well known that the electric field at the tip of an insulated wedge is singular when solving the two-dimensional Laplace equation for the electric potential. But if a wedge is highly charged to possess strong electric currents along the wedge surface, an imbalance of these currents can produce the so-called surface conductance effects that can either draw the electric field lines into or out of the wedge surface, and hence modify the local electric field behavior around the tip. We find that how an external field is applied is crucial to how surface conductance impacts the corner field, depending on if the applied field cuts around the wedge (cutting mode) or acts symmetrically over the wedge (impinging mode). For each mode, we not only examine how the field around the wedge behaves as the strength of surface conductance varies, but also address whether the singularity at the tip is enhanced/relieved by identifying how the field grows/decreases with distance from the tip.

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