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Numerical and analytic analysis of the effective secondary emission yield from velvet, foam, and other complex surfaces¹ C. SWANSON, I.D. KAGANOVICH, Princeton Plasma Physics Laboratory — Experiments measuring the secondary electron emission yield of complex surfaces [1] have suggested that the secondary electron emission may be suppressed by specially prepared complex surfaces. We model several surface types analytically and numerically and find large reduction in the secondary electron emission yield from the complex surface. We find a greatly reduced secondary electron emission yield for a velvet surface for nearly normal to the surface incident electrons. However foams can provide greatly reduced secondary electron emission yield for all incident electron angular distributions. We developed an algorithm for optimization of surfaces for suppressing secondary electron emission.

[1] R. Cimino et al., “Search for New e-cloud Mitigator Materials for High Intensity Particle Accelerators,” Proc. of IPAC2014, Dresden, Germany 2332-2334 (2014)

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