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Characterization of materials (with low secondary electron emission yield) for use in high-power microwave devices PRASHANTH KUMAR, TENGIZ SVIMONISHVILI, CHRISTOPHER WATTS, LESTER BOWERS, HERMAN BOSMAN, MARK GILMORE, EDL SCHAMILOGLU, JOHN GAUDET, University of New Mexico — Secondary electron emission (SEE) results from bombarding materials with electrons, atoms, or ions. The amount of secondary emission depends on factors such as bulk and surface properties of materials, energy of incident particles, and their angle of incidence. When studying SEE, one is interested in determining the *true* secondary electron emission yield (as opposed to reflected incident electrons), defined as the number of secondary electrons produced per incident primary electron. The goal of our research is to identify novel materials with a very low SEE yield coefficient that will make high-power microwave devices more efficient. To this end, we have employed a low-energy electron gun (5 eV to 2000 eV) to characterize different materials. Initial experiments are aimed at measurement of SEE with angular primary incidences, resolution of reflected primaries as well as comparison of experimental results with existing literature. These measurements are in the DC regime, but pulsed mode measurements are planned for the future to supplement the data. We also plan experiments to determine the effect of surface roughness on SEE yield. In addition, an ICEPIC (Improved Concurrent Electromagnetic Particle-in-Cell) simulation of SEE is performed in parallel.

Prashanth Kumar

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