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Secondary electron effects in dual frequency discharges MILES M. TURNER, Dublin City University, Ireland — Secondary electron effects are often characterized by an effective emission coefficient for each ion arriving at an electrode surface. This approach acknowledges that processes such as the photoelectric effect and fast neutral impact may be important, without representing them explicitly. However, the relative importance of these processes may vary with time during a radio-frequency period and may change as the discharge conditions change. In such cases, a fixed effective secondary emission coefficient is not satifactory. In this paper, we present particle-in-cell simulations including a detailed secondary emission model [1]. These simulations show that under typical dual-frequency capacitive discharge conditions, these issues are significant. Among other things, the effective secondary emission coefficient varies greatly with time, and can reach a maximum of 0.6, which considerably exceeds the values usually assumed. Consequently, secondary emission effects are of considerable significance and have a large effect on the discharge parameters. [1] A. V. Phelps and Z. Lj. Petrovic, Plasma Sources Sci. Technol. 8, R21 (1999).

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