

Abstract Submitted
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Dielectric window breakdown in oxygen gas: from vacuum multipactor to collisional microwave discharge¹ S.K. NAM, C. LIM, J.P. VERBONCOEUR, University of California, Berkeley, H.C. KIM, University of Science and Technology, Y.Y. LAU, University of Michigan — The major limiting factor in the transmission of high power microwave is dielectric window breakdown. Using a PIC/MCC model, dielectric window breakdown from vacuum multipactor to collisional microwave discharge in noble gases has been investigated [1]. In contrast with noble gases, however, the oxygen in air produces negative ions, which can reach five or more times the electron density with a strong impact on the breakdown. In this work, breakdown of a dielectric window in contact with oxygen gas is investigated over a wide pressure range, and extension of the theoretical scaling law for breakdown in noble gases [2] is sought for oxygen and air.

[1] H.C. Kim *et al.*, *Phys. Plasmas* **13**, 123506 (2006).

[2] Y.Y. Lau *et al.*, *Appl. Phys. Lett.* **89**, 261501 (2006).

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