

Abstract Submitted
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Calculations of Photoemission from Rutile HAROLD HJALMARSON, PETER SCHULTZ, CHRIS MOORE, Sandia National Labs — Photoemission is a well-known mechanism for release of electrons from a surface during electrical breakdown of a gas such as air. During air breakdown, UV photons, which are emitted from the highly excited gas molecules, are absorbed in the surfaces such as the cathode and the anode. These absorbed photons create energetic electrons, and a small portion of these electrons reach the surface. Those that overcome the potential energy barrier at the surface tend to be emitted. In this talk, the Boltzmann equation that describes these phenomena is formulated. A Monte Carlo probabilistic method is used to obtain the rate of electron emission as a function of photon energy. The role of bandstructure effects will be discussed. This bandstructure information is obtained by using a density-functional theory (DFT) method. Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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