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**Effect of electron detachment on the wall potential in the afterglow of an oxygen discharge** E.A. BOGDANOV, A.A. KUDRYAVTSEV, St. Petersburg State University, St. Petersburg, Russia, V.I. DEMIDOV, UES, INC., Dayton, OH, C.A. DEJOSEPH, JR., Air Force Research Laboratory, Wright-Patterson AFB, OH — Using a detailed, self-consistent model of a low pressure $O_2$ discharge, it is shown that detachment of electrons in the afterglow can lead to a significant increase in the negative wall potential with respect to the plasma potential. This effect can be used to modify the near-wall sheath electric field and thickness, which may be important for some plasma processing applications. In addition, the effect can lead to an increase in electron density with time, and a reduction in diffusion cooling of electrons and can thus be used to modify the electron temperature. The simulation was performed on a 100% modulated rf discharge operating at 13.56 MHz, using a commercial software package (www.cfdrc.com) with modifications. The density and mean energy of the electron component is obtained by solving either the fluid balance equations or the kinetic equations for the EEDF. The self-consistent electric field is found from Poisson's equation. Heavy particles are described using the fluid model and includes 160 plasmachemical reactions.

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