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Secondary electron emission induced by fast argon neutrals and its effects on rf plasmas ALEKSANDAR BOJAROV, MARIJA RADMILOVIC-RADJENOVIC, ZORAN LJ. PETROVIC, Institute of Physics Belgrade — In this paper we have examined a dual-frequency rf discharge in argon that is strongly affected by the secondary emission of electrons from the electrodes. We have used implicit "Particle In Cell" code as a tool for investigation of different electrode surface conditions that define the secondary emission. For precise description of the secondary emission we use analytic formulas suggested by Phelps and Petrovic (Plasma Sources Sci. Technol 8, R21, 1999). Two surface conditions, atomically "clean" and "dirty," describe the secondary emission as a function of the energy of impacting ion or atom on the electrode. In dual-frequency discharges one of the electrodes usually has some voltage bias, thus leading to greater production of fast neutrals on its side. Since on the biased electrode ion and neutral fluxes are greater than on the powered electrode, the secondary emission from biased electrode has a greater effect on the plasma. Results from our simulations show that secondary emitting fast neutrals can greatly affect the plasma, especially in discharges with intense production of neutrals in the sheath. We conclude that for precise description of rf discharges a realistic modeling of the secondary emission induced by ions and fast neutrals is necessary.

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