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Charge accumulations evolution in dielectric barrier discharges with various dielectric surface conditions. HARUAKI AKASHI, TOMOKAZU YOSHINAGA, National Defense Academy of Japan — Atmospheric pressure oxygen dielectric barrier discharges have been simulated to investigate the effect of accumulated charges behavior. In the present model, we only considered desorption of accumulated electrons w/ and w/o adsorption energy from the dielectrics. At first, waveforms of accumulated charge at filament discharge center and off filament with no desorption were examined. In positive charge period, two waveforms are significantly different, but in negative charge period, they are very similar. Because at the center of streamer, there is intense ionization to increase the positive charges, but off the streamer, it is much less. While in negative charge period, electrons are easily to drift and diffuse, so spread out to cover the dielectric surface. As a result, dielectric surface becomes non uniform in positive but becomes uniform in negative. In the case of desorption with no adsorption energy, the charge accumulation in early stage becomes completely different, and positive charges off filament center become significantly small. And the decrease of negative charges becomes significant, but the other tendencies are similar to no desorption case. While in the case of desorption with adsorption energy, the waveforms has mixed tendencies of two cases mentioned above.

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