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Application of nonlocal plasma technology for controlling plasma conductivity. CHENGXUN YUAN, Harbin Institute of Technology, V. I. DEMIDOV, WVU, A. A. KUDRYAVTSEV, I. P. KURLYANDSKAYA, Harbin Institute of Technology, T. V. RUDAKOVA, SPbGU, Z. X. ZHOU, Harbin Institute of Technology — A promising approach for better control of the plasma parameters involves the exploitation of peculiarities of plasmas with a nonlocal electron energy distribution. Nonlocal plasma technology (NLP-technology) is based on the effect of energetic electrons in the plasma volume. In this work, an experimental study of influence of the chemo-ionization processes on non-stationary plasma conductivity has been conducted. Due to energetic, supra-thermal electrons, which appear in the chemo-ionization reactions, the highly non-equilibrium and time dependent nonlocal electron energy distribution function is formed. In such a plasma thermal electrons always have positive conductivity (mobility), while supra-thermal, energetic electrons may have negative conductivity in heavy (argon, krypton and xenon) noble gases dependently on conditions. Experiments demonstrate that this effect may lead to the non-monotonic temporal behavior of plasma conductivity and may potentially create the negative electron mobility.

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