15th International Conference on the Physics of Non-Ideal Plasmas Almaty, August 30- September 4, 2015

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Extraction of nano- and small dispersed microparticles in the plasma of radio-frequency discharge

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Dusty plasma is an ionized gas containing nano- and micrometer sized particles of solid matter (dusts). Such solid particles in the plasma acquire a negative charge due to the high mobility of electron and levitate in it forming a plasma crystal. Investigation of plasma crystal is still ongoing in many research groups. In this work the method of extraction of nano- and microparticles in the plasma of radio-frequency discharge is considered. The proposed method is based on capture and control of the dusts using special traps that enable to modify the equipotential surface in the radio-frequency discharge plasma [1–3]. Using this method the fraction of silica nanoparticles with the average diameter of 600 nm was obtained and the fraction of small dispersed microparticles with the average diameter of 5 μm was also obtained. The polydispersive silica and alumina particles were used as initial powder for separation with size of particles in range of hundred nanometers up to hundreds micrometers. The advantages of the proposed method are the simplicity of technology and small dispersion of obtained particles after extraction as compared with existing analogues.

References

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