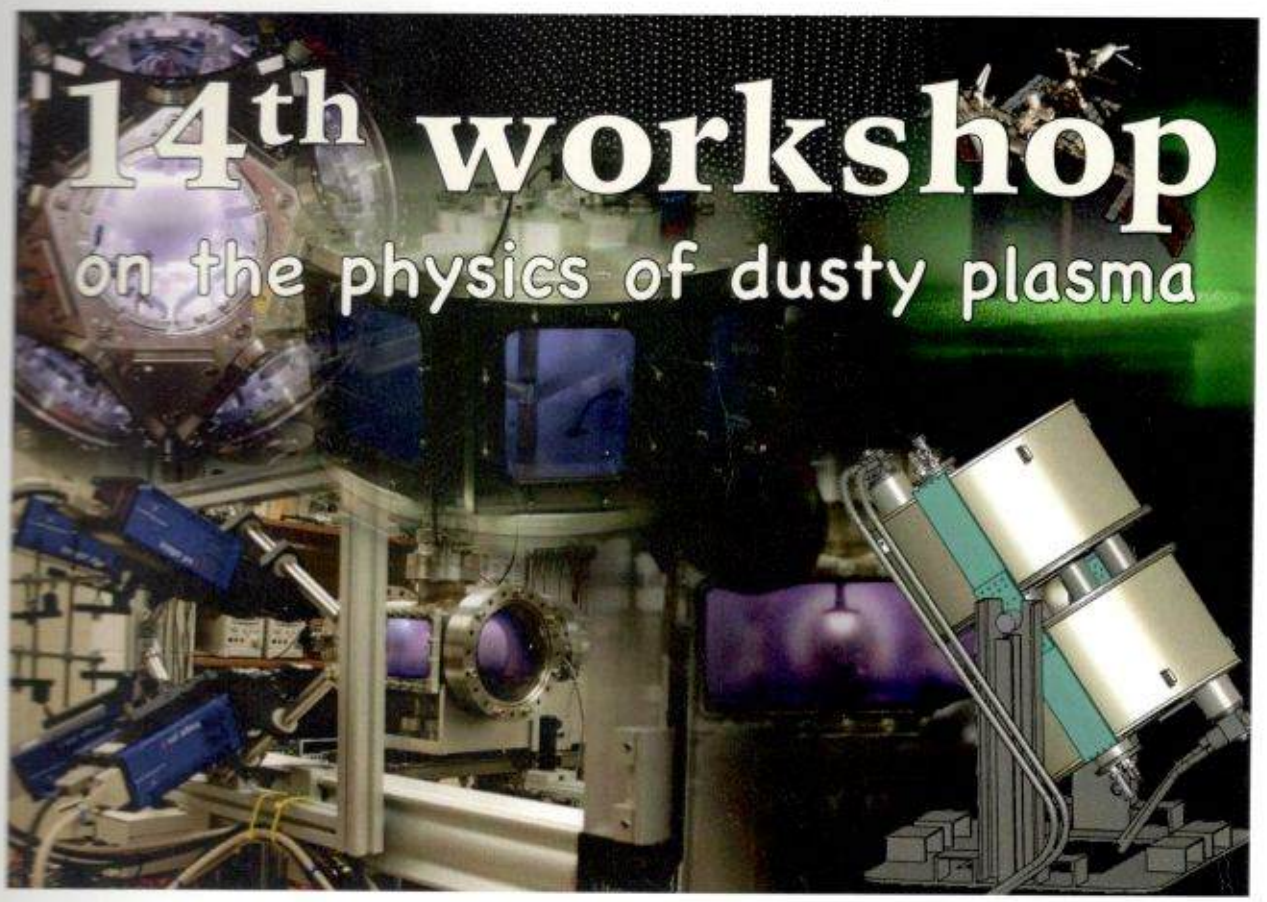

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Structural and transport properties of the complex plasmas in the combined gas discharge

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Gas discharge of combined RF and DC is used in many technological fields, particular in the processing, cleaning and sterilizing the surfaces of various materials [1-5]. This is due to the fact that the imposition of an additional electrostatic field on the RF discharge extends the capabilities of control the parameters of the buffer plasma [6].

In this paper the results of experimental studies of the properties of complex plasma in the high-frequency discharge with additional electrostatic field are presented. The following most important parameters such as the spatial distribution of the emission intensity, electrical characteristics and kinetic properties were determined. The structural and transport properties of complex plasmas in the combined discharge are investigated, in the result the explanation of the mechanism of chain formation of dust structures is given.

1. Lai W.T., Hwang C.J., Wang A.T., Yau J.C., Liao J.H., Chen L.H., Adachi K., Okamoto S. // Proceedings of the International Symposium on Dry Process. Japan: Nagoya, Institute of Electrical Engineers; 2006. - P.109.

2. Kawamura E., Lieberman M.A., Lichtenberg A.J., Hudson E.A. // J. Vac. Sci. Technol. A. – 2007. - Vol. 25, ъ5. – P. 1456-1474.

3. Eckbreth A.C., Davis J.W. // Appl. Phys. Lett. – 1972. – Vol. 21, ъ1. - P. 25-27.

4. Brown C.O., Davis J.W. // Appl. Phys. Lett. - 1972. - Vol. 21, ъ10. - P. 480-481.

5. Denpoh K., Ventzek P.L.G. // J. Vac. Sci. Technol. A. – 2008. – Vol. 26, ъ6. - P. 1415-1424.

6. V.A. Lysovskii, N.D. Harchenko // Vestnik Har'kovskogo universiteta, seria fizika "yadra, chastic, polya", (in Russian) № 899, Vol. 2. 2010.