

## **CONTINUATION OF THE EXPERIMENT "COULOMB CRYSTALS" UNDER MICROGRAVITY CONDITIONS: STEP BY STEP DESTRUCTION OF THE COULOMB CLUSTER IN A CUSP MAGNETIC TRAP**

L.G.D'yachkov<sup>1</sup>, O.F.Petrov<sup>1</sup>, M.M.Vasiliev<sup>1</sup>, M.I.Myasnikov<sup>1</sup>, V.E.Fortov<sup>1</sup>, T.S. Ramazanov<sup>2</sup>,  
K.N.Dzhumagulova<sup>2</sup>, M.T.Gabdullin<sup>2</sup>, M.K.Dosbolayev<sup>2</sup>, Y.A. Ussenov<sup>2</sup>,  
Zh.A.Moldabekov<sup>2</sup>, S.F.Savin<sup>3</sup>, T.A.Musabaev<sup>4</sup>, Zh.Sh.Zhantayev<sup>4</sup>, A.A.Aimbetov<sup>4</sup>

<sup>1)</sup> *Joint Institute for High Temperatures, RAS, 125412 Moscow, Russia*

<sup>2)</sup> *Al-Farabi Kazakh National University, Al Farabi av., 71, Almaty, Kazakhstan*

<sup>3)</sup> *S.P. Korolev Rocket-Space Corporation "Energy," 141070 Korolev, Moscow region, Russia*

<sup>4)</sup> *National Center of Space Research and Technology, KazCosmos, Almaty, Kazakhstan*

Experiments "Coulomb crystals" on board the International Space Station using a cusp magnetic trap for diamagnetic (graphite) particles [1–3] continue. At 14<sup>th</sup> Workshop CSCPIER 2016 [3] we presented results of an experiment on charging the Coulomb cluster and their expansion and scattering like a 'Coulomb explosion' when the central electrode potential was applied up to 150V. In this report we present results of the last experiment in which cluster charging was carried out gradually increasing the central electrode potential up to 150 V in four steps by 37.5V each with an interval of about 15 s between them. Increasing the potential initially resulted to hardly noticeable (at the first step) and then to more intensive particle scattering from the cluster surface in the form of filamentary complexes. But at 112.5 V (third step), we see the escape of some individual particles with velocities less than 1 cm/s. During three steps (45 s) the cluster lost about half of the particles mainly in the form of the filamentary complexes. After increasing the central electrode potential up to 150 V the cluster is destroyed completely during 8 s, particles left the cluster surface mostly individually with velocities of 1 to 4.5 cm/s. Estimates of the particle charge on the cluster surface have been performed by two ways, using depending on the cluster capacity and using their velocities observed. For explanation of the cluster destruction observed we have introduced the adhesion forces between particles into the corresponding model and shown that they play an important role in the balance of interparticle forces. The cluster structure in the cusp magnetic trap is discussed.

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### **References**

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