

## Complex plasma investigations in the PK-4 facility

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Complex plasmas are low-temperature plasmas containing a strongly coupled subsystem of charged solid microparticles. The subsystem of microparticles can be used as an atomistic model of classical condensed matter. It has been previously shown that complex plasmas allow to investigate many generic condensed matter phenomena [1] often at the individual particle level.. Since complex plasmas contain solid particles, they are significantly affected by gravity. Unstressed 3D microparticle systems can only be obtained under microgravity conditions.

Plasmakristall-4 (PK-4) is microgravity complex plasma facility on-board the International Space Station. The heart of PK-4 is a glass tube plasma chamber of 3 cm diameter and about 20 cm working area length [2]. In this chamber, plasma is generated by means of a dc discharge, whose polarity can be switched with the frequency up to 5 kHz. Microparticles of 1-10  $\mu\text{m}$  diameter can be injected into the plasma chamber. Manipulation devices like RF coils, manipulation laser, thermal manipulator are also available.

Since PK-4 commissioning in June, 2015, four scientific campaigns have been conducted. The scientific outcome of the campaigns will be presented and discussed. The topics include charging and drift of the microparticles in a dc discharge, dust-acoustic waves and 3D structure of the shear flow.

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### References

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