Creating of the stable dust structures in the glow discharge in magnetic field up to 20000 G [[1]](#footnote-1)\*)

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In recent studies [1,2] a dust plasma in a magnetic field of up to 10000 G was created under glow discharge conditions. The obtained results develop the understanding of physical processes detected earlier when the dust plasma was exposed by the weak magnetic field [3-7]. In addition, the glow discharge studies substantially complement the experimental data obtained in the dust plasma in strong fields under rf discharge conditions [8-10]; they give unique information about the volume dust formation and the stability of the discharge in the magnetic field.

The present work provides experimental data on the creation of dust plasma under the conditions of glow discharge in the strong magnetic field up to 20000 G. Dust trap in strata is characterized by considerable non-uniformity of parameters. Three-dimensional structures of up to ten particles in horizontal section have been created. Depending on the conditions, when the magnetic field increases, the dust structures may exhibit instability with complete or partial loss of the dust component.

Dust trap in the area of current channel narrowing is formed only when magnetic field is imposed. Dust structures have three-dimensional geometry and the ultra-fast rotation of tens of radians per second. The arrangement of the particles detects anisotropy in the horizontal plane. This trap is free from instability. In the magnetic field above 0.1 T, a dust trap occurs in the region of strong magnetic field non-uniformity near the upper end of the magnetic coil. The trap remains stable over the entire range of magnetic induction used.

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVII/Lt/ru/FR-Karasev.docx) [↑](#footnote-ref-1)