ENCLOSEG SHORT-CIRCULID COILS FROM HTSC 2 TAPE FOR GALATEA TRAP MAGNETIC SYSTEM [[1]](#footnote-1)\*)

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The report discusses the advantages of using embedded magnetic coils made of HTSC 2 tape to create magnetic systems with levitating coils of the trap-Galatea type [1] Such coils operate at the temperature of liquid nitrogen. The nested magnetic coil consists of several, at least two, coaxially nested short-circuited coils, each of which is made of HTSC 2 tape [2]. The experiments were carried out on nested coils using short-circuited single coils with a diameter of 80mm, 60mm and 50mm. The electrical resistance of the individual coils is (20 - 50) nΩ. The space between these coils was filled with plastic tape wound around an inner coil. The experiments carried out have shown that the magnitude of the magnetic flux captured when charging the embedded coil is close to the sum of the flux captured by the individual coils. The relaxation time of the magnetic field is also close to the sum of the relaxation times of each individual coil. This arrangement of the magnetic coil makes it possible to change the value of the maximum flux captured by the coil. The relaxation of the magnetic field occurs exponentially. This indicates that the ratio of the currents in each individual coil remains constant when charged. In the nested coil, you can change the profile - the distribution of the magnetic field along the radius of the coil, by changing the magnitude and direction of the current in the nested coils. Experiments were carried out to study levitation of both individual coils over a system of permanent magnets, and nested coils. The individual coils levitate obliquely with respect to the vertical, which corresponds to the axis of the permanent magnet system. This indicates the deviation of the axis of the magnetic field created by the current in the levitating coil from the geometric axis of the coil. The nested coil, made up of individual coils, levitates without tilting to the vertical. The axis of the magnetic field of the nested coil coincides with the geometric axis of the nested coil. The use of nested coils makes it possible to increase the maximum magnetic flux captured by the coil when a current is excited in it, to change the profile of the distribution of the magnitude of the magnetic field along the radius of the coil by changing the magnitude and direction of the current in the nested coils, and to eliminate the deviation of the axis of the magnetic field of the coil from the geometric axis of the coil.

References

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2. M.V. Kozintseva, A.M. Bishaev, A.A. Bush, A.V. Desyatskov, K.E. Kamentsev Patent for utility model No. 205644
1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLIX/Mu/ru/CG-Bishaev.docx) [↑](#footnote-ref-1)