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## **Mon-Mo-Po1.09-07 [103]: Design and Analysis of a Special Lateral Suspension Coil for a Spherical Superconducting Rotor**

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At temperatures near absolute zero, the materials used in the superconducting magnetic suspension device are chemically inactive and the electrical losses are very low, which makes the device have a high accuracy in measuring angular velocity and angular displacement. In order to determine the accuracy of the device, it is necessary to carry out the drift test for the device. One of the commonly used methods for drift test is the torque feedback method. However, this method requires that the device be able to rotate 90 degree. In this paper, in order to meet this requirements of the drift test, four special lateral suspension coils were designed, which were evenly distributed along the equator of the spherical rotor. When the device was deflected by 90 ° for the drift test, circumferential support forces can be provided by the four lateral suspension coils. Levitation characteristics of the lateral suspension coils were analyzed by using 3-D magnetic field finite element analysis method. Due to the special structure, a tooling was designed for winding the lateral suspension coils. The results will be helpful for the drift test of the superconducting magnetic suspension device next step.

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