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Thu-Mo-Po4.14-06 [113]: Effect of magnetic field attenuation due to superconducting joint resistance during gravity measurement

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The superconducting joint resistance in the superconducting magnetic levitation coil leads to the continuous decrease of the closed-loop current, which causes a weakening of the levitation magnetic field in the gravity measuring device. This magnetic field attenuation will cause the falling of the superconducting sphere used to measure gravity, making the measured data larger than the real data.

In this paper, the cold-welding process for superconducting joints used in gravity measuring devices is studied first, and the magnetic field attenuation caused by the joint resistance is also analyzed. Then, a finite element model was established to find the change in the position of the sphere due to the attenuation of the magnetic field. Moreover, the influence of such sphere position changes on gravity measurement is also obtained, and a compensation method for the influence is proposed.

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