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Mapping of the magnetic field in the n2EDM experiment

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The uniformity of the magnetic field inside the inner part of the n2EDM experiment is a crucial condition to achieve the desired sensitivity of $10^{-28} e\ cm$ for the neutron electric dipole moment (EDM). The magnetic-field mapper is a dedicated nonmagnetic robot designed to measure the magnetic field at any point of a large cylindrical volume ($0 \leq \rho \leq 780\ mm$, $0 \leq \phi \leq 360°$, $-410 \leq z \leq 410\ mm$). It was installed in the n2EDM setup in 2021 and has been playing a key role in the n2EDM experiment preparation. Its purpose during the first mapping campaign is to characterize and qualify the inner parts of n2EDM: the remanent field inside the MSR, the production of the $1\mu T$ neutron holding field, the magnetic purity of the octagonal vacuum tank.

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