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# New Magnetically Shielded Room for $^{3}$He/$^{129}$Xe co-magnetometer experiments

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The $^{3}$He/$^{129}$Xe co-magnetometer is a high precision experiment that can address a variety of fundamental questions including the measurement of the \textit{CP}-violating permanent electric dipole moment (EDM) of the $^{129}$Xe atom, looking for a violation of Lorentz Invariance, and searching for a spin-dependent \textit{P}- and \textit{CP}-violating nucleon-nucleon interaction mediated by Axions or axion-like particles. Next level $^{3}$He/$^{129}$Xe co-magnetometer experiments require improved magnetic conditions. Here, we report on the performance of a new Magnetically Shielded Room (MSR) consisting of three layers of Mu-metal with a thickness of 3˜mm each, and one additional highly conductive copper-coated aluminum layer with a thickness of 10˜mm. The MSR has a cubical shape with an accessible interior volume with an edge length of 2560˜mm. An optimized degaussing (magnetic equilibration) procedure, and shielding factor and residual magnetic field measurements will be presented.

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