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The Neutron Electric Dipole Moment Experiment at Oak Ridge National

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The search for additional CP-violating interactions generated by BSM physics motivates a strong experimental effort to measure the neutron electric dipole moment (nEDM). The nEDM@SNS experiment planned at the Spallation Neutron Source at Oak Ridge National Laboratory aims to achieve a sensitivity of $2—3\times10^{-28}$ e-cm, an improvement upon the current limit of $1x10^{-26}$ e-cm. This is accomplished through a novel combination of ultracold neutrons (UCNs) and a controlled, dilute mixture of superfluid ^{4}He with spin polarized ^{3}He. This talk will give a summary of the experiment and planned measurements of the ^{3}He diffusion constant inside the superfluid –useful for the design of nEDM@SNS as well as other UCN experiments.

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