

Moiré Neutron Interferometer for Precision Measurement of G.

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We have demonstrated a novel type of phase-grating moiré neutron interferometer which has a million times greater intensity than conventional neutron interferometers. This setup also allows for broad wavelength acceptance and relaxed requirements related to fabrication and alignment, thus circumventing the main obstacles associated with perfect crystal neutron interferometry. The moiré interferometer can have a total length of 10m allowing for a wholly unique measurement of Newton's gravitational constant. One can take advantage of the long path of the setup to place a large mass along the neutron paths. The benefit over atom interferometry would be precise knowledge of the neutron path with respect to the source mass. This presentation will describe the operation of the interferometer and provide an outlook as to the future applications and challenges remaining to be solved to fully realize the potential of this novel new technique.