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A High-Efficiency Resonant RF Spin Flipper with Broad Phase Space Acceptance for Pulsed Polarized Cold Neutron Beams PIL-NEYO SEO, North Carolina State University, NPDGAMMA COLLABORATION — The NPDGamma collaboration has developed a RF resonant spin flipper to reverse the neutron polarization in a 10 cm×10 cm pulsed cold neutron beam from a $m=3$ supermirror neutron guide with high efficiency over a broad cold neutron energy range. The resonance spin flipper is a RF solenoid directed along the neutron beam and operated in a homogeneous 10-G magnetic field transverse to the neutron beam at Los Alamos Neutron Science Center. An aluminum shield confines the RF field and effectively attenuates electro-magnetic coupling of the RF power to devices outside the rotator. We report the result of spin-flip efficiency measurements where the neutron beam was both polarized and analyzed by optically-polarized ^3He neutron spin filters. The effect of the spin reversal by the rotator on the neutron beam phase space is compared qualitatively to RF neutron spin flippers based on adiabatic fast passage.

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