

Abstract Submitted
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Design of an adiabatic spin flipper for epithermal neutrons. Spin flip efficiency calculations ALBERTO PEREZ-MARTIN, LIBERTAD BARRON-PALOS, IF-UNAM-C, NOPTREX COLLABORATION — An adiabatic spin flipper (SF) was designed as a part of a neutron transmission experiment developed at LANSCE (Los Alamos Neutron Science Center) in order to study parity violation (PV) in resonances of compound nuclei accessible with epithermal neutrons. A similar setup will be used in a transmission experiment to study time reversal invariance violation (TRIV) in the same systems. The PV term in the zero-angle scattering amplitude for neutrons is highly dependent on the spin orientation relative to its momentum [1], so the spin has to be precisely manipulated. The shape of the ideal magnetic field was found and an arrangement of electric currents was designed to produce such a field. The theoretical efficiency of the spin flipper [2] and its dependence on the magnetic field intensity was calculated. The magnetic field amplitude resulting in high and stable efficiency was chosen. After having the magnetic field maps for the SF space region a spin transport simulation was carried out in order to determine a more realistic efficiency of the apparatus.

References

- [1] J.D.Bowman, V.Gudkov, Phys. Rev. C 90, 065503 (2014)
- [2] J.D.Bowman, S.I.Penttila and W.B.Tippens, Nucl. Instrum. Methods A369, 195 (1996)

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