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**Instrumentation for the search of possible exotic forces using polarized low-energy neutrons**[1] LIBERTAD BARRÓN-PALOS, Universidad Nacional Autónoma de México, NEUTRON SPIN ROTATION COLLABORATION — The limits on possible exotic forces of mesoscopic range that depend on the relative momentum and spin of at least one of the interacting particles are scarce due to the challenges that macroscopic amounts of polarized matter impose on precision experiments. In particular, a possible interaction between polarized particles and matter, mediated by the exchange of a light vector boson with weak couplings to matter and relatively long range, can be investigated using low-energy neutrons, whose energy and momentum transfers are ideal to access the mesoscopic distance scale and can be formed into intense beams with high polarization. Since the possible exotic interaction of interest would manifest itself as a forward tilt in the spin of transversely polarized neutrons passing near a perpendicular planar mass, the Neutron Spin Rotation collaboration implemented an experiment to search for this force using a sensitive slow neutron polarimeter in combination with a fifth-force target. In this talk I will describe two key components of the apparatus, the input and output coils that transport the neutron spin in and out of the virtually zero magnetic field region where the target is immersed, and the rotating 4-quadrant array of planar masses that constitutes the target.

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