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Development of Spin-Exchange Polarized 3He Target Cells that Incorporate both Glass and Metal MADUKA M. KALUARACHCHI, YUNXIAO WANG, DANIEL J. MATYAS, WILLIAM A. TOBIAS, YUAN ZHENG, VLADIMIR NELYUBIN, GORDON D. CATES, Univ of Virginia — Approved experiments at Jefferson Lab following the 12 GeV upgrade will include a measurement of the elastic electric form factor of the neutron using a polarized ^{3}He target at a luminosity more than ten times higher than previous experiments. Historically, polarized ^{3}He targets at JLab have been made out of glass. At higher beam currents, it will be desirable to incorporate metal windows through which the electron beam can enter and exit. There is only limited data on nuclear spin relaxation due to metal surfaces and the alkali metal we use in spin-exchange optical pumping (the technique we use to polarize the ^{3}He) has adverse effects on certain metal surfaces causing it to be more relaxing over time. For this reason we have been studying spin relaxation on a variety of metals that may be incorporated in our targets. Measurements from Mainz show, under significantly different conditions, that gold is a promising candidate [A. Deninger et. al., Eur. Phys. J. D **38**, 439 (2006)]. Among the results we will present are spin-relaxation measurements of cells made of glass and OFHC copper in which the copper has been plated with gold. Our measurements show considerable promise for a new generation of high-luminosity polarized ^{3}He targets.

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