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High performance hot neutron polarizer based on in-situ polarized ^3He neutron spin filter EARL BABCOCK, Forschungszentrum Juelich GmbH, ZAHIR SALHI, Forschungszentrum Juelich GmbH, JCNS at the MLZ, VLADIMIR HUTANU, RWTH Aachen University, Forschungszentrum Juelich GmbH — We have developed compact and high performance in-situ ^3He polarizers based on spin-exchange optical pumping for the polarization and polarization analysis of hot (wavelengths from 0.3 to 1.1 Å, and energy from 60 to 1000 meV) neutrons. Efficient polarization of neutrons of these wavelengths/energies is difficult to perform. Our ^3He polarizers have been commissioned and used for 0.9 Å neutrons where neutron polarizations in excess of 97 % with over 24 % neutron transmission are achieved. The performance can easily be extended to 0.3 Å neutrons as would be available on the POLI instrument at the MLZ in Germany[1] by utilizing a higher pressure ^3He cell. Consequently we are in the processes of completing an upgraded polarizer design optimized for this neutron instrument that can also operate in the vicinity of the available 8 T sample magnet. These polarizers will be used for studies of magnetism in single crystal neutron diffraction as well as fundamental and particle physics. Using the double focused beam of POLI they enable one of the most intense polarized hot neutron beams available. [1]Heinz Maier-Leibnitz Zentrum. (2015). POLI: Polarised hot neutron diffractometer. Journal of large-scale research facilities, 1, A16. <http://dx.doi.org/10.17815/jlsrf-1-22>

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