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Dynamics of the fast component of nano-confined water under electric field SOULEYMANE DIALLO, EUGENE MAMONTOV, ANDREY PODLESNYAK, GEORG EHLERS, Oak Ridge National Laboratory — We have investigated the diffusion of water molecules confined in the pores of folded silica materials (FSM), by means of quasielastic neutron scattering in the time range of 1 picosecond and 65 picoseconds. The measurements were performed on the direct geometry time-of-flight instrument CNCS at the Spallation Neutron Source, for temperatures between 220 K and 245 K, and at two electric field values, 0kV/mm and 2kV/mm. The goal was to investigate the effects of moderate electric field on the previously observed fast component of nano-confined water. In contrast to our earlier observation on the slow dynamics (at longer times) [1], the present results indicate a less drastic effect of applied electric field on the fast dynamics.

[1] S.O. Diallo, E. Mamontov, S. Inagaki, Y. Fukushima, and N. Wada, “Enhanced Translational Dynamics of Water under Electric Field” Phys. Rev. E 86, 021506 (2012).

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