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A new perfluorinated Polymers at liquid Nitrogen Temperature as a UCN Storage Material

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The uncertainty of the value of the neutron lifetime was raised from 0.8 seconds to 1.1 seconds due to three new wall storage experiments whose results were taken into account. To support solving this "Puzzle of Neutron Lifetime"we are preparing an UCN-wall storage experiment with a novel wall coating. We were able to obtain and analyze a perfluorinated polymer as proposed by Pokotilovski in 2002. It fulfills both a hydrogen free wall material and a very low melting point (about -155℃) whereby the neutron losses by inelastic scattering can be further reduced. Currently we are performing first storage experiments at the ILL, Grenoble to determine the UCN loss coefficient eta for this coating material. We expect this to be lower than the loss coefficient of the so far used Fomblin. We present first results and a perspective of using this polymer as a wall Coating Material

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