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Polarizing protons using photoexcited triplet states and its application to build a neutron spin filter

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Polarized protons have a strong spin dependent interaction with neutrons and offer an interesting alternative to a polarized 3He spin filter. A concept for a polarized proton spin filter based on a rather new scheme of dynamic nuclear polarization (DNP) employing photoexcited triplet states, has been realized. It requires neither high fields nor very low temperatures to achieve high proton polarizations. The novel DNP scheme and its technical implementation are described and the results of a test of principle experiment with such a filter on the cold white neutron beam of BOA at SINQ are presented.

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Instrumentation

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