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Estimation of the performance of a HERMES-type gas target internal to the LHC

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A storage cell target is capable of producing a high areal density at minimum gas flow into a vacuum system, e.g. that of the LHC. It may be fed with polarized hydrogen atoms for the study of single-spin asymmetries in ultra-relativistic fixed-target pp collisions, or similar light-ion reactions with spin. Another application could be to inject heavy noble gases like Xe ($M \approx 131$) in conjunction with a Pb beam to investigate Heavy Ion collisions. In a recent study [1], the performance of a storage cell target combined with LHC beams has been estimated under realistic assumptions. The luminosities obtained are for pp collisions of the order $10^{33}/cm^2s$, and for HI collisions of the order of the Pb-Pb collider design value of $10^{27}/cm^2s$. The assumptions and results will be discussed in the talk.
[1] C. Barschel, P. Lenisa, A. Nass, and E. Steffens, Advances in High Energy Physics - special AFTER@LHC issue, Article ID 463141. Accepted for publ. July 5, 2015.

Primary author: Dr STEFFENS, Erhard (Univ. of Erlangen-Nürnberg)

Presenter: Dr STEFFENS, Erhard (Univ. of Erlangen-Nürnberg)

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