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Simulations of Antihyperon-hyperon Physics for PANDA

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At high energies the strong force is well described using quarks and gluons as degrees of freedom, while at lower energies hadronic degrees of freedom are more adequate. The PANDA energy regime is in the transition region between these two descriptions. $p\bar{p} \rightarrow \bar{\Lambda}^0 \Lambda^0$ is a good reaction to test models based on these two alternative viewpoints. The weak decay of the hyperons gives direct access to spin degrees of freedom in their production process, which in turn, can be related to the role of spin in the creation of strangeness (or charm in the case of charmed hyperons). Furthermore, the exclusive production of hyperons and antihyperons in $p\bar{p}$ collisions can also be used to study violation of CP invariance.

We present results of simulations that show that PANDA is very suitable for doing this kind of studies. If data exist for these reactions, at all, PANDA will exceed the previous measurements by orders of magnitude in statistics. Many hyperon channels for which there are no experimental data, e.g. charmed hyperons, will be accessible.

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