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Phenomenological study of exclusive binary light particle production from antiproton-proton annihilation at FAIR/PANDA

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Exclusive binary annihilation reactions induced by antiprotons of momentum from 1.5 to 15 GeV/c can be extensively investigated at FAIR/PANDA [1]. We are especially interested in the channel of charged pion pairs. Whereas this very probable channel constitutes the major background for other processes of interest in the PANDA experiment, it carries unique physical information on the quark content of proton, allowing to test different models (quark counting rules, statistical models,..). To study the binary reactions of light meson formation, we are developing an effective Lagrangian model based on Feynman diagrams which takes into account the virtuality of the exchanged particles. Regge factors [2] and form factors are introduced with parameters which may be adjusted on the existing data. We present reproduce results of our formalism of different reactions of light meson production for reliable predictions of cross sections, energy and angular dependencies in the PANDA kinematical range.

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