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Studying the phi meson in nuclear matter from simulated pA reactions

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The behavior of the ϕ meson in nuclear matter has attracted renewed interest because of (recent and future) experiments that aim to study its properties in nuclei [1-3]. Theoretically, many works have however been conducted assuming infinite nuclear matter [4-5], which is not realistic from an experimental point of view. To relate theoretical predictions with experimental observables, a thorough understanding of the actual reaction, in which the ϕ meson is produced in a nucleus, is required. For the past E325 experiment at KEK [1] and the future E16 experiment at J-PARC, this is a pA reaction with initial proton energies between 10 and 30 GeV. To simulate such a reaction, we make use of the PHSD transport code, which is based on a covariant microscopic transport model [6]. In this framework, the ϕ meson spectral function obtained theoretically as a function of density, can be used as an input, while the output of the simulation can be compared with experimentally observed dilepton spectrum.

In this presentation, I will give an overview of first results obtained in simulations of the reactions probed at the E325 and E16 experiments.

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