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The η'-optical potential in the nuclear medium based on the η'N interaction from a chiral effective model SHUNTARO SAKAI, Kyoto University, DAISUKE JIDO, Tokyo Metropolitan University — In this talk, we discuss the η' optical potential based on the η'N two body interaction obtained from a chiral effective model. The η' mass reduction inside the nuclear medium is expected by the degeneracy of the pseudoscalar-singlet and octet mesons in the chiral restored phase in the chiral limit. The observation of the η'-nucleus bound state is planned experimentally. Here, we estimate the η' optical potential using the η'N interaction obtained from linear sigma model. The η'N interaction in the linear sigma model comes from the scalar meson exchange and UA(1) symmetry breaking, and it is found to be fairly strong attraction. This strongly attractive two body interaction leads to a deep and attractive optical potential. Moreover, the transition to ηN channel is included in our calculation, so the η' optical potential have imaginary part. The imaginary part is relatively small compared to the real part in our estimation. Such a strongly attractive and the small absorptive η'-optical potential in the nuclear medium gives narrow bound states in η' and nucleus systems.

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