Beitrag ID: **12** Typ: **nicht angegeben**

The eta' optical potential in nuclear medium based on the eta'N interaction from a chiral effective model

Mittwoch, 17. September 2014 13:30 (20 Minuten)

In this talk, we discuss the eta' optical potential based on the eta'N two body interaction obtained from a chiral effective model.
The eta' 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 eta'-nucleus bound state is planned experimentally.
Here, we estimate the eta' optical potential using the eta'N interaction obtained from the linear sigma model.
The eta'N interaction in the linear sigma model comes from the scalar meson exchange and UA(1) symmetry breaking effect, 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 etaN transition is included in our calculation, so the eta' 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 optical potential gives narrow bound states in eta' and nucleus systems.

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Sitzung Einordnung: session I