THE THRESHOLD ANOMALY OF OPTICAL POTENTIALS AND THE DISPERSION RELATION FOR WEAKLY-BOUND NUCLEAR SYSTEMS

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Understanding the nucleus-nucleus interaction is a basic task in the study of nuclear reactions. The optical potential is universally adopted to phenomenologically describe the interaction of nuclear collisions. For tightly-bound nuclear systems, optical potentials show a threshold anomaly behavior at energies around the Coulomb barrier, which can be explained well by the dispersion relation. For weakly-bound nuclear systems, however, optical potentials show a totally different behavior, the so-called breakup threshold anomaly, which is not yet understood both experimentally and theoretically. Recently, optical potentials of ^{6}He+^{209}Bi, ^{64}Zn systems were extracted with good precision via one-proton transfer reactions of ^{208}Pb, ^{63}Cu(^{7}Li, ^{6}He) at energies from well-above the barrier and down to well-below the barrier. Results show that the traditional dispersion relation cannot describe the behavior of imaginary and real potentials. The underlying physics is needed to be explored further. Details will be presented in the conference.