Two-body Wave Functions, Compositeness, And The Internal Structure Of Dynamically Generated Resonances

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Hadrons that have different configurations from ordinary three quarks (*qqq*) for baryons or quark-antiquark pair (qq^{bar}) for mesons are referred to as exotic hadrons, and to discover exotic hadrons and to reveal its internal structure are one of the most important topics in hadron physics.

In recent years, "compositeness" has been discussed intensively so as to distinguish the hadronic molecules from hadrons in other compact configurations (such as *qqq*). The compositeness is defined as the norm of two-body wave function, which contributes to the normalization of the total wave function, and hence measures a "fraction" of the two-body composite state composing a certain hadron. Therefore, by evaluating the compositeness and comparing it with unity, one can conclude whether a certain hadron is really hadronic molecule or not.

In this contribution, I introduce the physical meaning of the compositeness, its expression, and theoretical evaluation in effective models. In particular, we show that the two-body wave function of the bound state corresponds to the residue of the scattering amplitude at the bound state pole, which means that solving the Lippmann-Schwinger equation at the bound state pole is equivalent to evaluating the two-body wave function of the bound state. Then, we evaluate the compositeness for the so-called dynamically generated resonances in the chiral unitary approach, such as Λ(1405), *N*(1535), and *N*(1650), and investigate their internal structure in terms of the hadronic molecular components.