

The compositeness of a bound state constrained by a and r_0 and the role of the interaction range

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We present an approach that allows one to obtain information on the compositeness of molecular states from combined information of the scattering length of the hadronic components, the effective range, and the binding energy. We consider explicitly the range of the interaction in the formalism and show it to be extremely important to improve on the formula of Weinberg obtained in the limit of very small binding and zero range interaction. The method allows obtaining good information also in cases where the binding is not small. We explicitly apply it to the case of the deuteron and the D_{s0}^* (2317) and D_{s1}^* (2460) states and determine simultaneously the value of the compositeness within a certain range, as well as get qualitative information on the range of the interaction.

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