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Determination of compositeness of hadronic resonances: The $\Lambda(1405)$ radiative decay and the $a_0(980)$-$f_0(980)$ mixing TAKAYASU SEKIHARA, Research Center for Nuclear Physics (RCNP), Osaka University, SHUNZO KUMANO, High Energy Accelerator Research Organization (KEK) — In hadron physics, one of the most important tasks is to pin down the effective degrees of freedom for the structure of individual hadrons. Especially, so as to identify the hadronic molecules, whose degrees of freedom are hadrons themselves, concept of compositeness has been constructed recently as amounts of the hadronic two-body composite states [1]. In this talk we discuss possiblities to determine the compositeness of hadronic resonances in experiments. We first investigate structure of the $\Lambda(1405)$ resonance by its radiative decay [2], and next investigate structure of the $a_0(980)$ and $f_0(980)$ resonances by their mixing intensity [3]. For this purpose we establish relations between their compositeness and the experimental observables. Then, combining the established relations and experimental data on the $\Lambda(1405)$ radiative decay width and the $a_0(980)$-$f_0(980)$ mixing intensity, we discuss $\bar{K}N$ molecular structure for the $\Lambda(1405)$ resonance and $K\bar{K}$ molecular structure for the $a_0(980)$ and $f_0(980)$ resonances.

[1] T. Hyodo, Int. J. Mod. Phys. A 28, 1330045 (2013).
[2] T. Sekihara and S. Kumano, Phys. Rev. C 89, 025202 (2014).
[3] T. Sekihara and S. Kumano, in preparation.

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