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**8Be+alpha rotational states and alpha condensate in 12C** YASURO FUNAKI, RIKEN, Nishina-Center — The Hoyle state, the second 0+ state in 12C, is known to have the nature of alpha condensation, in which the 3alpha particles occupy an identical S-orbit, with a dilute gaslike structure of weakly interacting alpha particles. The second 2+ state in 12C was observed at a few MeV above the Hoyle state in experiments. It is also reported that the new 4+ state is observed at around 13.3 MeV. The candidates of the third and fourth 0+ states, which are close to the second 2+ state, are also reported recently. While all these states are expected to have well developed 3-alpha-cluster structure, a band nature of these states are completely unknown. 8Be+alpha rotational band is one interpretation and the alpha condensate nature might be deeply related to the band nature. Some authors argure that some of these states form a rotational band with triangular shape. Aiming at solving this puzzling situation, we employ an extended version of the so-called Tohsaki-Horiuchi-Schuck-Ropke (THSR) wave function, which inherently has structures of 2-alpha +alpha clusters as well as of the gaslike 3alpha clusters. With this model wave function, we discuss the band nature and mutual relation between these excited states, focusing on the strength of E2 transition.

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