Recent results on the structures of heavy helium nuclei obtained in the direct reaction studies with the beams of ^{6}He and ^{8}He.

S.I. Sidorchuk[a], A.S. Fomichev[a], M.S. Golovkov[a], S.A. Krupko[a], Yu.Ts. Oganessian[a], A.M. Rodin[a], R.S. Slepnev[a], S.V. Stepantsov[a], G.M. Ter-Akopian[a], R. Wolski[ab], A.A. Korsheninnikov[cd], E.Yu. Nikolskii[cd]

[a] *Flerov Laboratory of Nuclear Research, JINR, 141980 Dubna, Russia*
[b] *The Henryk Niewodniczanski Institute of Nuclear Physics, Krakow, Poland*
[c] *RIKEN, Hirosawa 2-1, Wako, Saitama 351-0198, Japan*
[d] *On leave from the Kurchatov Institute, Kurchatov sq. 1, 123182 Moscow, Russia*

In a survey of clustering structures revealed in the halo nuclei ^{6}He and ^{8}He by means of direct reactions, new experiments realizing the quasi-free alpha,2alpha scattering (QFS) are discussed in more detail. QFS occurring with the alpha core bound in ^{6}He was detected when a helium gas target cooled down to 14 K was bombarded by the secondary ^{6}He beam of the energy of 25A MeV, produced at the fragment separator ACCULINNA (Dubna). Correlation distributions obtained for the momentum values characteristic to the alpha-2n and n-n subsystems in ^{6}He are presented for measurements corresponding to different angular ranges of the alpha-alpha QFS. The data analysis was done within the framework of Plane Wave Impulse Approximation with the use of a three-body wave function of ^{6}He. Possible limitation on the assumption of a pure pole mechanism of the alpha knock-out reaction and the ways allowing one to come to transparent results in similar experiments are discussed.