

Abstract Submitted
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Near Fermi Energy reaction dynamics and clustering in alpha-conjugate systems XIGUANG CAO, Texas A&M University, KATARZYNA SCHMIDT, Institute of Physics, Silesia University, Katowice, Poland, E.-J. KIM, Division of Science Education, Chonbuk National University, Jeonju 561-756, Korea, K. HAGEL, M. BARBUI, S. WUENSCHHEL, J.B. NATOWITZ, H. ZHENG, N. BLANDO, A. BONASERA, G. GIULIANI, Texas A&M University — Theoretical study predicted that the self-organizing of alpha cluster is favored over deuteron below a critical density with moderate temperature, where the possible Bose-Einstein condensation (BEC) is expected to occur. However the experimental information about the alpha states at low density is scarce. It is natural to pursue experiments with α conjugate beams and advanced detection apparatus to explore the collective dynamics of alpha clustered systems at low density. Systematical experiments were carried out with ^{40}Ca and ^{28}Si beams at 10, 25, 35 MeV/u incident on ^{28}Si , ^{12}C , ^{40}Ca and ^{180}Ta targets, detected with the NIMROD-ISiS 4 Pi detector array. It is found that there is a strong neck-like emission, which consists mainly of alpha-like fragments. The characteristic of the α emission source is explored by shape analysis, multi-particle correlation and quantum fluctuation approaches. How these observables reveal the possible alpha BEC in low density and possible exotic toroidal and linear chain configurations made out of alpha clusters is discussed.

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