The analysis of experimental data in the reaction 40Ar+9Be at energy 36 MeV/nucleon and comparison with model calculations

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The analysis of experimental data obtained in the reaction 40Ar+9Be at an incident beam energy of 36 MeV/nucleon on the magnetic separator COMBAS was carried out with the aim of studying competition between different reaction mechanisms in the Fermi energy region. Special attention was paid to velocity distributions of forward-emitted fragments since they contain important information about processes occurring during collisions.
Velocity distributions showed a pronounced asymmetry indicating the presence of at least two main components. One component associated with direct fragmentation was described by Goldhaber distribution and corresponded to direct knockout of fragments from the projectile nucleus. The other component located on the left side of the distribution was related to dissipative processes such as deep inelastic transfer.

Additionally, the report presents comparison of experimental data with simulation results for isotopic and velocity distributions using various methods based on transport-statistical and parametrical models. These results emphasize the necessity of taking into account both mechanisms simultaneously when describing reactions at Fermi energies.