

# Transfer-reemission processes in the $^{197}\text{Au} + ^{197}\text{Au}$ reaction at 23 MeV/nucleon bombarding energy

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The  $^{197}\text{Au} + ^{197}\text{Au}$  collisions at the bombarding energy of 23 MeV/nucleon were studied by the CHIMERA Collaboration at the INFN Laboratori Nazionali del Sud (LNS) in Catania. The Charged Heavy Ion Mass and Energy Resolving Array (CHIMERA), arranged in  $4\pi$  geometry, was used as the detection system in this experiment.

Our present analysis is concentrated on a class of ternary reactions, in which one observes a projectile-like fragment (PLF), target-like fragment (TLF), and also a third fragment of  $Z \geq 3$ , a so called intermediate mass fragment (IMF). It is demonstrated that the mass numbers of the IMFs emitted in the  $^{197}\text{Au} + ^{197}\text{Au}$  reaction at 23 MeV/nucleon cover a much wider range than in typical neck-fragmentation reactions at intermediate energies. We propose a new method of the “moving source analysis” enabling to identify the origin of the observed IMFs in the situation when the trajectory of a possible source of the IMFs is strongly influenced by the Coulomb interaction between the target and projectile nuclei. It is demonstrated that reactions with emission of heavy IMFs are true multinucleon transfer-reemission processes, which seem to be the doorway to the multinucleon transfer reactions leading to the bound states of the residual nuclei. Very heavy and even super-heavy residual nuclei could be formed in these multinucleon transfer reactions.