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FARCOS correlator in the CHIFAR exp.: latest results from particle correlation studies

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The study of the reaction mechanisms and of the emission probability of Intermediate Mass Fragments (IMFs) in non-central Heavy Ion collisions was the main aim of the CHIFAR experiment, carried out at LNS-INFN. The CHIMERA collaboration investigated nuclear reactions at the incident beam energy of 20 A MeV using different combinations of three beams: ^{124}Sn , ^{112}Sn and ^{124}Xe , and three targets: ^{64}Ni , ^{58}Ni and ^{64}Zn , in order to study combinations of neutron rich and neutron poor systems. These systems were selected to highlight the role of the isospin degree of freedom of the colliding nuclei.

The experimental setup was composed by the coupling, for the first time, of ten telescopes of the FARCOS (Femtoscope ARray for COrrrelation and Spectroscopy) correlator with the 4π CHIMERA multi-detector. This coupling allowed the study of the correlations between IMFs and light charged particles generated in a nuclear reaction.

Two stages of Double Sided Silicon Strip Detectors (DSSSDs), 300 μm and 1500 μm thick respectively, and a third stage of 4 CsI(Tl) crystals, 6 cm thick, were used to compose each FARCOS telescope. The energy and angular high resolutions of FARCOS guarantees the measurement of the energy and of the position of the detected particles with very high precision.

The latest results of FARCOS in term of energy calibration for DSSSDs and CsI(Tl), identification and pixelation procedures and preliminary result of the physics (including energy, velocity and angular particle correlations) will be presented.

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