CHIMERA, A 4π CHARGED PARTICLES DETECTOR FOR INTERMEDIATE ENERGY NUCLEAR REACTION STUDIES

S. Aiello[b], A. Anzalone[a], M. Baldo[b], G. Cardella[b], S. Cavallaro[a,e], E. De Filippo[b], A. Di Pietro[a,e], S. Feminò[c,f], M. Geraci[b,e], P.Guazzoni[d,g], C.Iacono-Manno[a], G. Lanzanò[b], U. Lombardo[b,e], S. Lo Nigro[b,e], A. Musumarra[a,e], A. Pagano[b], M. Papa[b], S. Pirrone[b], G. Politi[b,e], F. Porto[a,e], A. Rapisarda[b], F. Rizzo[a,e], S. Sambataro[b,e], M. L. Sperduto[a,e], C. Sutera[b], L. Zetta[d,g].
INFN:[a] Lab.Naz.del Sud,[b] Sez.di Catania and [c] Gr.coll.di Messina, [d] Sez.di Milano Dip.di Fisica: [e] Univ.di Catania,[f] Univ. di Messina,[g] Univ. di Milano. Italy

The construction of the charged particles detection array, named CHIMERA, started in 1994.

This device is composed of 1200 Si+Cs(Tl) telescopes assembled in a cylindrical geometry to form 9 concentric rings,placed at different distances from the target,in the forward direction($1^\circ - 30^\circ$) and a spherical surface, $40cm.$ in radius, in the backward direction ($30^\circ - 176^\circ$).

The apparatus will be devoted to experiments aimed to study fundamental problems in heavy ion physics, like the nuclear equation of state, liquid-vapour phase transitions, hot nuclei instability, ion-ion collision dynamics and multifragmentation.

The high granularity of this apparatus reduces the multiple firing, and moreover,its combination with the very large covering ($0.94 * 4\pi$) of the overall solid angle, enables a significant total reconstruction of each event.

CHIMERA is shaped in such a way to operate also with TOF technique measurements, allowing a mass identification of the detected fragments, very useful when the energy is lower than the threshold determined by the thickness of the first stage of the telescopes, namely the fragment is stopped in it. Furthermore, the use of the TOF technique overtakes the limit, typical of detectors based on charge identification, due to the Bragg peak. The tests carried out on a prototype telescope, confirm that we can reach an identification threshold lower than $0.5MeV/A$ for fragments with $A \geq 4$ as provided by the simulations.

The construction of CHIMERA, including the electronic chains and the data acquisition system appointed to it, will be completed in 1998. The first step which provides the covering of the angular range($1^\circ - 10^\circ$) is in progress as scheduled.