at 1 GeV/u, using the quantity Z_{bound} of the coincident projectile decay, measured with the TOF wall of the ALADIN spectrometer. Fig. 1 compares the temperatures given by three different isotope - ratio thermometers in the Z_{bound} range corresponding, as in [1], to the excitation energy vange 0 - 15 MeV/u of the target residue [2]. The results agree rather well, with T_{Hedt} lying systematically somewhat lower than the other two temperatures.

A striking feature of the light - particle spectra (Fig. 2) is the preequilibrium component as exemplified by the difference between the experimental (black dots) and the statistical - model predicted (open points) spectra. Its magnitude increases systematically with decreasing particle mass (A=3 not shown) and excitation energy of the residue (decreasing Z_{bound}). Part of the results pertaining to central collisions in S117 is presented in [3].

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1.8 Study of Pre-breakup Light Particle Emission in HI Collisions at Relativistic Energies*

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Light charged particle (Z = 1,2) spectra emitted in peripheral to semicentral Au + Au collisions at 1 GeV/u (see [1] and the preceding research note) revealed significant components emitted prior to attainment of statistical equilibrium by the target residue, the stage at which multifragmentation most probably occures. Since these serve for diagnostic purposes in all thermometers in current use, a due account needs to be taken of the contributions coming from each of the pre-breakup and evaporative stages of the residue disassembly. This goal imposes stringent requirements on the instrumentation of low energy thresholds, wide dynamic range and good energy resolution.

The short - term program of the ALADIN Collaboration will address the spectra of light charged particles in the joint experiment with the French laboratories, using INDRA multidetector - the most advanced of the presently existing instruments possessing multiparticle detection capability. To this end target residue disassembly products will be studied in ^{12}C + ^{197}Au collisions at 1 and 2 GeV/u. The experiment is forseen for late 1998.

The long - term program focuses on neutrons emitted by the target residue in peripheral to semicentral ^{197}Au + ^{197}Au collisions at 600 and 1000 MeV/u. Excitation energy will be tagged with the aid of Z_{bound} of the coincident projectile fragments with the ALADIN forward spectrometer. A Monte - Carlo program MSX was written [2] to perform a comparative study of conceivable neutron detecting systems: a large - volume Gd - loaded liquid scintillation detector ("Neutron - Ball") with the multidetector DEMON consisting of 96 separate organic liquid scintillators.

An upgrade of the detection capability of the ionization chamber MUSIC - III is underway. This includes construction and installation of the new proportional counters and the associated electronic chains. An application of the current sensitive preamplifiers will permit to feed signals from the counters directly to flash - ADC's, eliminating the shaping amplifiers, thus simplifying considerably the electronic system. The gained simplicity will permit to increase significantly the number of cathode pads, thereby leading to increased accuracy of the y - coordinate determination of the detected fragments. Tests of several types of current - feedback operational amplifiers, available on the market, will be performed to select for the preamplifiers the optimum one from the point of view of the forseen application.

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