In our previous experiments [1–3] we have observed many dramatic tunabilities of new decay type of low and middle excited heavy nuclei called “collinear cluster tri-parallel” (CCT) due to the features of the process observed. The main results were obtained at the modified FOBOS and mini-FOBOS setups based on the gas filled detectors of the FOBOS spectrometer [4] in the frame of the “missing mass” method. It means that only two fragments were actually detected in each fission event (in opposite detectors, at 180°) and total mass M was served as a sign of a multibody decay, if it is significantly smaller than the mass of the initial system. In order to increase reliability of selecting of the CCT events by means of direct detection of all of the CCT partners new COMETA (Correlation Mosaic E-T Array) spectrometer was put into operation in the Flerov Laboratory of the JINR. A simpler prototype of this spectrometer we have successfully used earlier for searching for the CCT channel in the mass range 70–230 amu [5].

Preciosity of the experiment: measuring of the heavy ions masses in the frame of the TOF-E (time-of-flight vs. energy) method in the wide range of masses and energies.

**Detsectors**

**Systematics**

Data acquisition system (DACS) for the COMETA setup is based on those used earlier at FOBOS spectrometer. The entire system is organized on the basis of several PCs with the LABWindows software under the operatinal systems familay Windows (different versions) and Linux. Using those OS and software allows one to visually analyze and to scale up the experimental output data. The main software tool of the DACS is the program for the offline processing and visualization of the data without reduction of the speed of data acquisition, also it is possible to observe the debugging data in real-time.

**Data storage**

The program is dedicated to prepare the configuration file for the description of the experimental hardware to be read by WinELTEC, also it can serve as a database and import file for the main client-program. It is used for connection and controlling of the WinELTEC according to the hardware description, accepting and processing the data in real-time and generating the data file for the further analysis. Data is stored in the data base file in the frame of the “missing mass” method, presented in the bottom part of the plot shown above. The main file contains the result of the analysis of the TOF-E data.

**Calibration of E and channels, calculation of the TOF-E FF masses**

The use of the conventional detectors in TOF-E spectrometers of heavy ions (in FF) is known to have unelaborated methodological problems due to the “amplitude (pulse-height defect)” and “plasma delay” effects in the E and TOF channels, respectively. The first effect involves nonlinearity in the dependence of the “deposited energy versus electrical charge measured”, while the latter distorts the TOF used in the calculation of the heavy ion masses. Correct accounting for both effects is rather simple if the processing of the experimental data is done in the frame of the “missing mass” method, presented in the bottom part of the plot shown above. The main file contains the result of the analysis of the TOF-E data.

**Conclusions**

The COMETA setup presented here proved to be an adequate instrument for study of very specific multibody decay channel of heavy nuclei called collinear cluster tri-parallel (CCT). Forthcoming upgrade of the spectrometer involves essential increase of its aperture for fragments from multibody decays.