

A DSP-BASED CONTROL SYSTEM FOR THE MULTI-DETECTOR CHIMERA.

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The control of 4pi-multidetector systems for charged ion detection employed in Intermediate Energy Physics, as CHIMERA, needs to check the stability and good working mode of the whole system. We have chosen to do not employ special signals for the detectors and electronic chain controls, but to use the physical signals coming from CHIMERA, produced by the studied reactions. To reach this aim, we have realized a distributed architecture of both PCs and commercial DSP-boards. This, from one side allows to perform high-speed computations of the special algorithms used for the control of the multidetector and from the other side to use high level programs, already available for the data presentation, distributing the workload over different processors. To perform the on-line computation, as fast as possible to avoid any loss of data, we have chosen to use ADSP-SHARC 21060. The boards are installed in host PCs, under Windows NT 4.0, and controlled by a multilayer and multithread custom software architecture (C++ compiled). The system is strictly related to the data acquisition system from which receives data through the Ethernet network. Extensive benchmarking tests have been carried out to determine performances and actual possibilities of the system, both using data previously collected, and in on-beam test, using the Superconducting Cyclotron at LNS in Catania.