

Data Acquisition, Analysis, and Monitoring for Cancer Therapy at GSI

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Abstract

A system of three dimensional raster scanning of carbon beam used for cancer therapy has been designed and built at GSI and is in operation since end of 1998. The front-end real-time system is based on VME boards with DSPs designed and built at GSI. The system is operated in two modes:

First, the treatment mode. The beam is steered automatically according the patient's treatment plan. During the treatment a real-time visualization of the scanning process is required without any possibility of distortion. Therefore all needed data measured by the front-ends is sent from one of the DSPs via a separate bus to a sufficiently big memory located in a different VME crate. A processor in this crate sends the data as it arrives in the memory via TCP to the monitor program running on an AIX machine where it is displayed in nearly real-time.

In experimental mode the same system is used for quality control of the beam before the treatment. The measured beam positions and shapes are sent through the same data channel to an analysis package developed at GSI.

Both, monitoring and analysis, use IDL from Research Systems, Inc. for visualization.