

REAL TIME SIGNAL PROCESSING PLATFORM FOR PULSAR OBSERVATIONS AT THE GMRT

Ramchandra M. Dabade(1), Kiran H.Dahimiwal(2), Yashwant Gupta(2),
(1)TataElxsi, Bangalore, India,(2) National Centre for Radio Astrophysics, TIFR,
Pune, India

In the array mode of operation, the GMRT is an excellent instrument for the study of pulsars. We describe here the special purpose hardware and the real-time signal-processing platform that is used for this. A scalable, distributed multiprocessor digital back-end based on DSP processors and PLDs processes the high speed data (64MBps) from the GMRT Array Combiner to produce output data at sampling rates ranging from 128 microsec upward. These data are acquired and processed in real time on a network of general purpose computers. The processing includes data validation, accurate time tagging and also pulsar specific signal processing such as time and frequency integration, running mean subtraction and data width reduction, gating and folding, as well as real time monitoring of the signals. This is achieved with the help of distributed and parallel processes running on different computers, using shared memories, message queues and TCP/IP sockets for inter-processor communications and synchronization