



ASTRONOMY: Spectroscopic data acquisition instruments

Radio astronomers are using a multiprocessor-based data acquisition instrument to investigate the magnetic field in the interstellar medium of our Galaxy.

This instrument is allowing them to measure the direction and field strength of the magnetic field of the Milky Way. Based on the **Sundance** hardware architecture combined with **3L Diamond** codesign tool-suite, the system is now deployed on the 26-m radiotelescope of the Dominion Radio Astrophysical Observatory (DRAO) in Penticton, Canada. It features an instantaneous bandwidth of 500 MHz and a spectral resolution of 2048 channels. The phase relation of the two input signals is measured in real-time and using 3L Diamond, the instrument design was completed in only 18 months, allowing scientists to deploy the data acquisition system earlier than would have otherwise been possible. Based on the NRC system, DRAO astronomers are now leading a project to utilize this method with other radiotelescopes around the globe including the 100-m Effelsberg telescope in Germany and the 64-m telescope at the Parkes Observatory in Australia.

"The detailed study of magnetism in the Milky Way is made possible by new developments and technologies in radio astronomy including new wide-band antennas, wide-band digital receivers and new data analysis tools. By coupling the 3L Diamond tool-suite with modular hardware from Sundance we were able to quickly develop a cost effective, very high performance multiprocessing solution and use it years ahead of expectations."

Maik Wolleben, Covington Fellow at the Canadian National Research Council, Canada

"We were delighted to be selected for this ground-breaking project and to help create a system that is driving fundamental understanding. By using Diamond, the NRC designers were able to leverage our pre-packaged integration with the Sundance hardware and focus their effort on delivering the spectroscopic DAQ in record time."

Dr. Peter Robertson, 3L Managing Director, United Kingdom

Hardware Configuration: UWB-5000

Sundance Multiprocessor Technology



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