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THE ITASEL/SETI-ITALIA NEW PROGRAMMABLE SPECTRUM ANALYSER

Abstract

SETI-Italia (Search for Extra Terrestrial Intelligence) activities are going on since 1998 at the Medicina 32 mt dish, in piggy back mode, exploiting the peculiar features of the Serendip IV system. Due to the availability of advanced computing silicon engines (Digital Signal Processors -DSP), a fast, high-performance reconfigurable data acquisition system is under development within the ITASEL program, which is supported by the Italian Space Agency (ASI). The system is at present being designed at the Institute of Radioastronomy in Medicina (Bologna). It is planned to be powered by very fast programmable gate arrays (FPGAs). The spectrometer will offer - for each board with a maximum of 4 boards / crate PCI - a 100 MHz input bandwidth with a programmable number of channels, ranging from 256 to 64 millions (real time). Since, among other employments, this device can be programmed to operate as a high resolution spectrometer, it will also be aimed at achieving very accurate SETI observations, besides being efficiently employed in the search for emission lines (Spectrometry). Therefore it will be possible to perform several different activities with a single programmable back end. It will be possible also to implement fast algorithms - already tested on a CPU cluster - for the KL Transform computation. This transform is known to be extremely suitable for detecting any kind of modulated ETI signal.