

High Performance Power Spectrum Analysis Using a FPGA Based Reconfigurable Computing Platform

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Abstract

Power-spectrum analysis is an important tool providing critical information about a signal. The range of applications includes communication-systems to DNA-sequencing. If there is interference present on a transmitted signal, it could be due to a natural cause or superimposed forcefully. In the latter case, its early detection and analysis becomes important. In such situations having a small observation window, a quick look at power-spectrum can reveal a great deal of information, including frequency and source of interference.

In this paper, we present our design of a FPGA based reconfigurable platform for high performance power spectrum analysis. This allows for the real-time data acquisition and processing of samples of the incoming signal in a small time frame. The processing consists of computation of power, its average and peak, over a set of input values. This platform sustains simultaneous data streams on each of the four input channels.