



A FPGA-BASED FAST CONVERGING DIGITAL ADAPTIVE FILTER FOR REAL-TIME RFI MITIGATION ON GROUND BASED RADIO TELESCOPES

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We report the development of a real-time, digital adaptive filter implemented on a Field Programmable Gate Array (FPGA) capable of processing 4096 spectral channels in a 1 GHz of instantaneous bandwidth. The filter is able to cancel a broad range of interference signals and quickly adapt to changes on the RFI source, minimizing the data loss without any assumption on the astronomical or interfering signal properties. The speed of convergence (for a decrease to a 1%) was measured to be 208.1 μ s for a broadband noise-like RFI signal and 125.5 μ s for a multiple-carrier RFI signal recorded at the FAST radio telescope (China). The filter will be installed in the largest single-dish radio telescope in the world (FAST) in China on November 2017.