Poster

Improving UVOIR MKID Readout

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We report on the current state of the digital readout of our astronomical instrument, the ARray Camera for Optical to Near-infrared Spectrophotometry (ARCONS). ARCONS houses an array of Microwave Kinetic Inductance Detectors (MKIDs), optimized for 400-1100 nm observations with both timing and energy resolution. MKIDs are frequency domain multiplexed, allowing for most of the complexity of readout electronics to reside at room temperature instead of at low temperature. The MKID readout for ARCONS was built around hardware produced by the Collaboration for Astronomy Signal Processing and Electronics Research (CASPER), Reconfigurable Open Architecture Computing Hardware (ROACH) boards. These boards are used to quickly process the frequency multiplexed signal, which includes performing a “channelization” process to separate each pixel's contribution as well as finding and collecting the signature of individual photons. The readout system has recently been scaled up from reading out 1024 pixels to 2024 pixels by increasing the number of ROACH boards used. The readout is also in the process of being upgraded from ROACH-1 boards to ROACH-2 boards to take advantage of the latter's more powerful Virtex 6 FPGA. The additional FPGA resources will enable us to increase the pixel count further.