Readout Electronics for NIKA

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Abstract - We developed a prototype of digital frequency-domain multiplexing electronics allowing the real time monitoring of microwave kinetic inductance detector (MKIDs) arrays for mm-wave astronomy. It requires only 2 coaxial cables for instrumenting a large array. For that, an excitation comb of frequencies is generated and fed through the detectors.

The direct frequency synthesis and the data acquisition relied heavily on a large FPGA using parallelized and pipelined processing. The prototype can instrument 128 resonators (pixels) over a bandwidth of 125 MHz. After detailing the technical solution chosen, the algorithm used and the results obtained, the talk briefly presented the upgraded version that is in development.

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