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## A 16 channel frequency-domain-modulation readout system with custom superconducting LC filters for the SWIPE instrument of the balloon-borne LSPE experiment

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We present the design, implementation and first tests of the superconducting LC filters and the frequency domain readout of spiderweb TES bolometers for the SWIPE experiment on the balloon-borne LSPE mission. LSPE is optimized to measure the linear polarization of the Cosmic Microwave Background at large angular scales to find the imprint of inflation on the B-mode CMB polarization. The Short Wavelength Instrument for the Polarization Explorer (SWIPE) is composed of 3 arrays of multi-mode bolometers cooled at 0.3K, with optical components and filters cryogenically cooled below 4K to reduce the background on the detectors. Polarimetry is achieved by means of large rotating half-wave plates and wire-grid polarizers in front of the arrays. In SWIPE angular resolution is traded off for sensitivity. Microwave radiation will be detected at the three frequencies of 140, 220 and 240 GHz to disentangle the expected cosmological signal from inflation from the galactic and extragalactic background, for a 13 days survey covering 25% of the sky.

LC filters are designed, produced and tested at the INFN sections of Pisa and Genova where thin film deposition and cryogenic test facilities are present, and where also the TES spiderweb bolometers are being produced.

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