

Transmission Based Characterisation of Superconducting Metamaterial

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Abstract. Waveguides with superconducting Josephson junction-based metamaterial are widely used as parametric amplifiers. However, the precise estimation of power entering the device is crucial for the estimation of gain and noise temperature. This is nontrivial when the measurement tract is not symmetrical. We present a basic framework for the analysis of properties of such nonlinear systems and calibration of the input power. Utilizing measurements with varied temperature and power of the input signal, we estimate additional attenuation of the input line. We demonstrate a precise calibration procedure of a Josephson junction metamaterial.