Title: Josephson parametric amplifier utilizing aluminum shadow evaporation without a suspended bridge.

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Abstract:

In recent years, there has been a growing need to detect weak one photon level microwave signals. Moreover, detection needs to occur over a wide range of frequencies. A parametric amplifier using a nonlinear Josephson element can solve this problem. Recently, several designs have been offered by multiple groups around the world, but all of them have either insufficient characteristics (bandwidth at the level of 10 MHz) or are difficult to produce (traveling wave designs containing 2000 identical Josephson junctions). We present a design of a parametric amplifier which is relatively simple to manufacture in a single lithography step. With this straightforward fabrication process, we observe a significant increase in bandwidth up to 100 MHz with 20 dB gain, giving near quantum-limited noise performance.