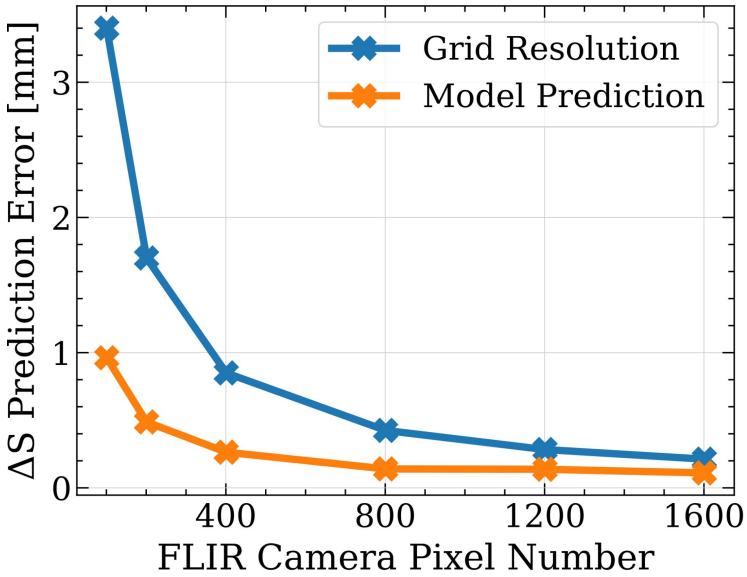
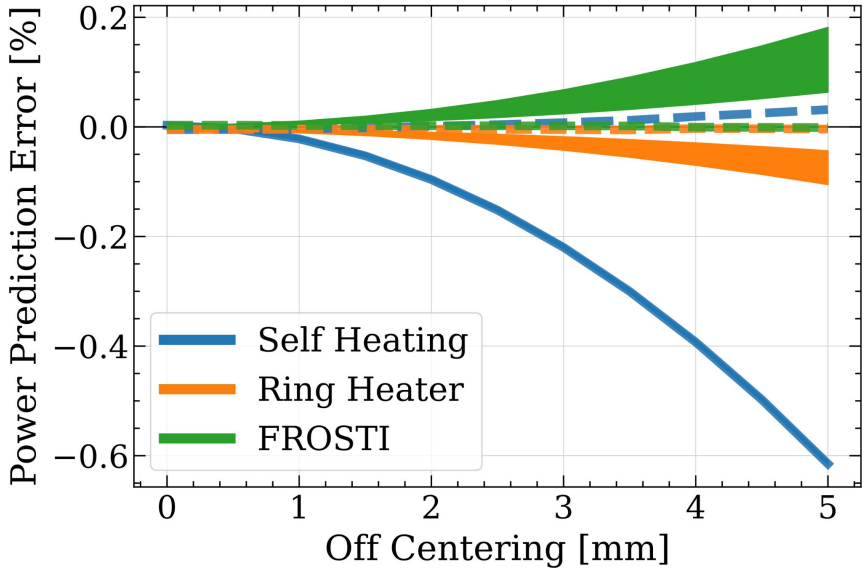
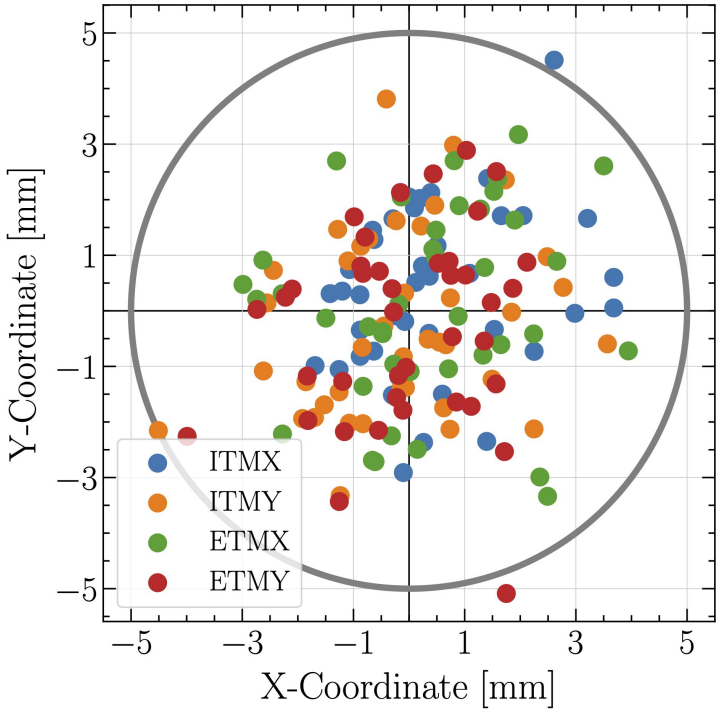
Improved Uncertainties with FLIR Correction

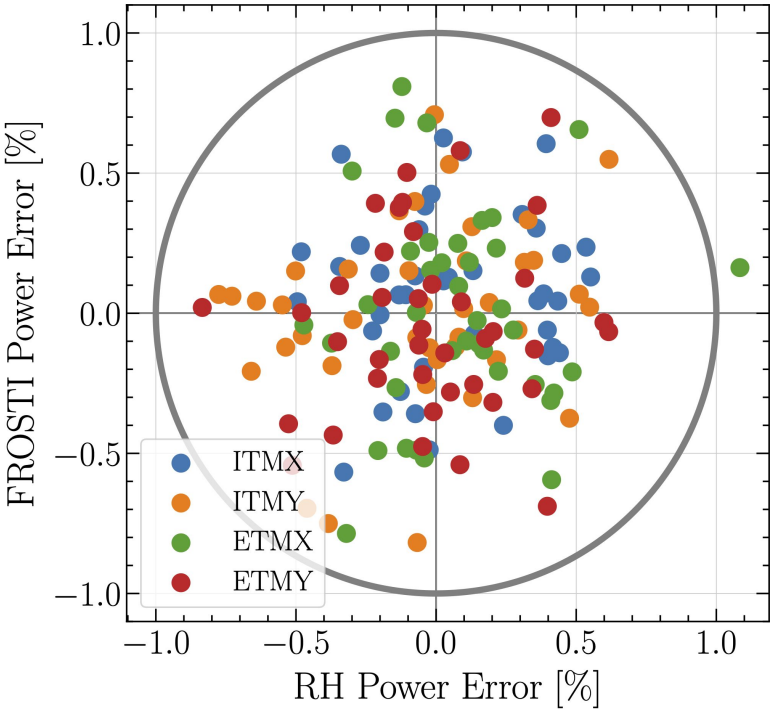




Beam position prediction limited by the resolution:
0.17*2/600 ≈ 0.5 mm

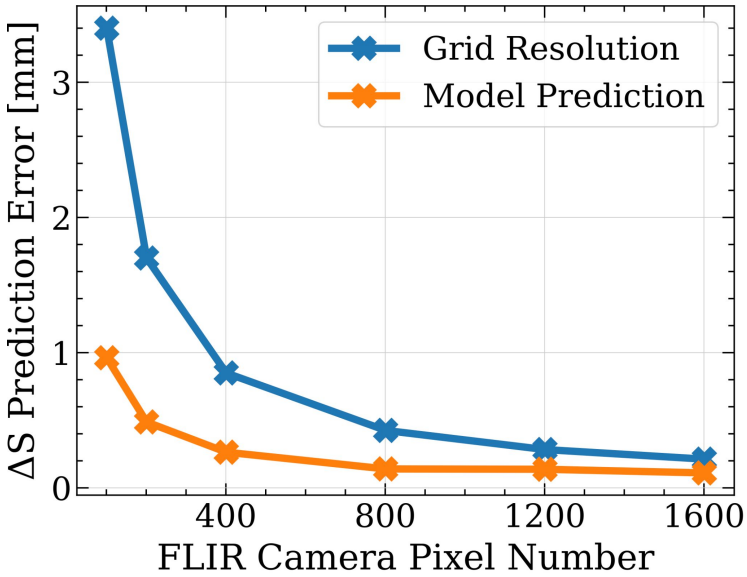
Thermal source absorbed power prediction better than at least 0.1%





Monte-Carlo simulation with randomly miscentered beam positions on the test masses (Left, with 3σ = 5 mm), and RH/FROSTI power uncertainties (Right, with 3σ = 1%)

In total, (2+2)*4 = 16 dimensional parameter space



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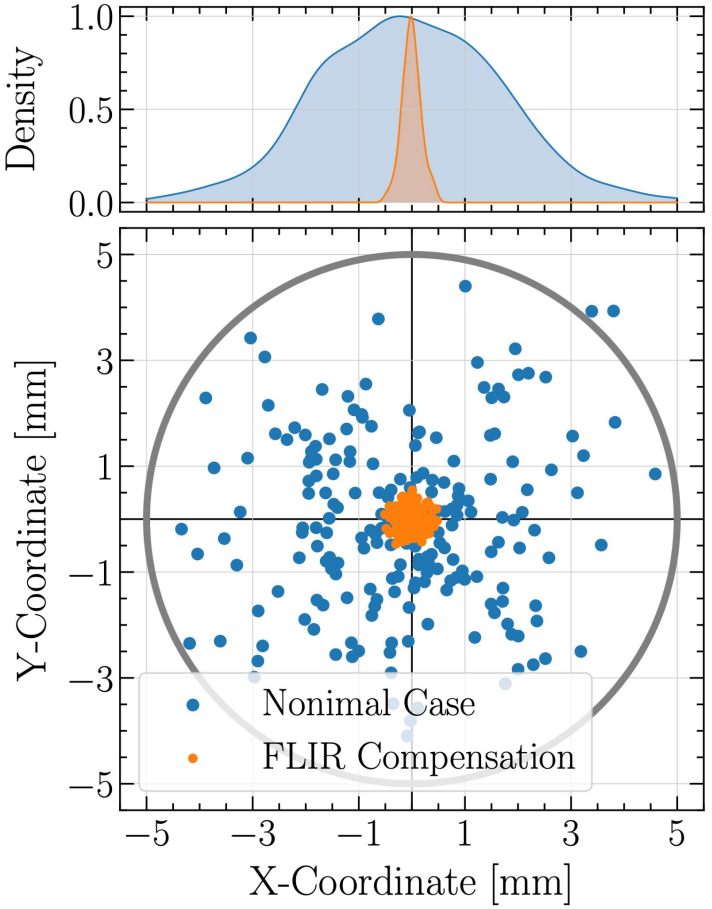
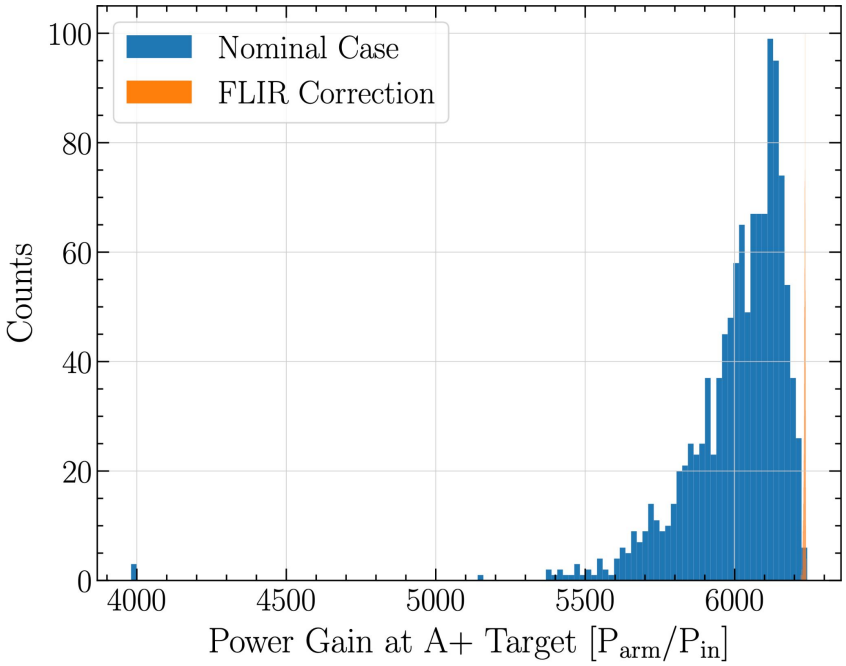
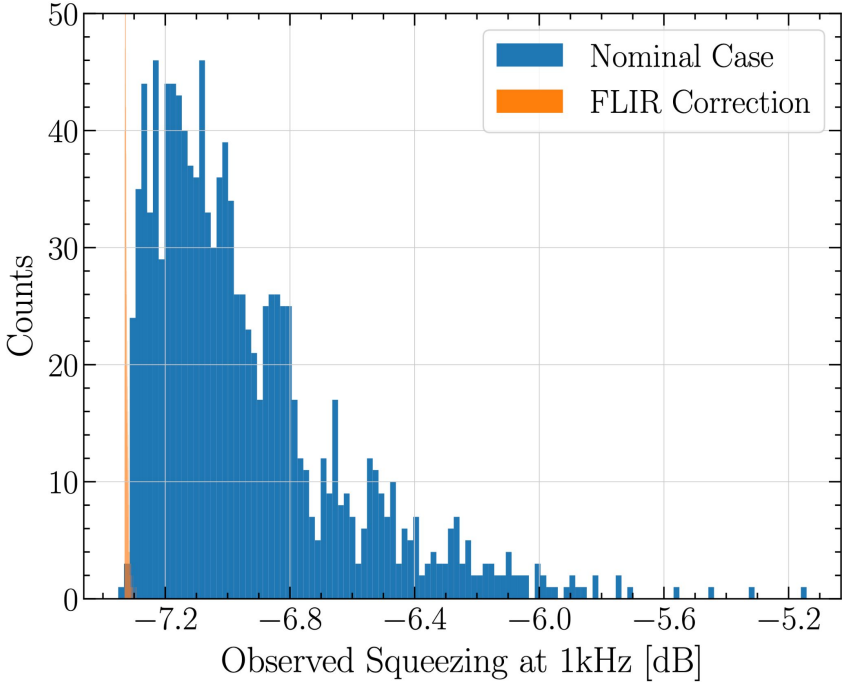
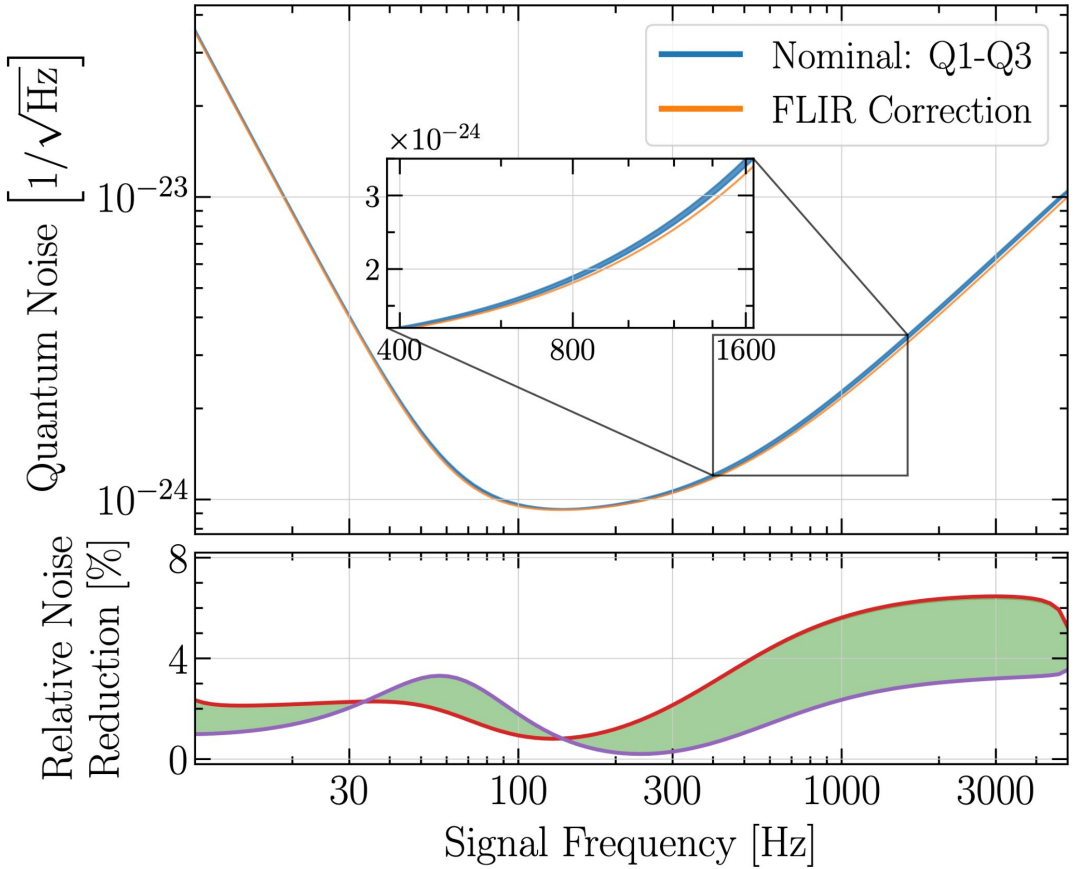






Monte-Carlo simulation (1200 trials) and results in Power Gain (Left) and the observed squeezing (Right) for the nominal case (5mm and 1%) and the FLIR correction case (0.5 mm and 0.1 %)



Comparison of the the 25th and 75th percentiles (Q1-Q3) from the nominal case and the FLIR correction case

Quantum noise improvement of 3%-6%