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Experimental Limits on Gravitational Waves in the MHz Frequency Range with the Fermilab Holometer ROBERT LANZA, The University of Chicago, THE FERMILAB HOLOMETER COLLABORATION — We present the results of a search for gravitational waves in the 1-10MHz frequency range using dual power-recycled Michelson laser interferometers at Fermi National Accelerator Laboratory. An unprecedented level of sensitivity to gravitational waves in this frequency range has been achieved by cross-correlating the output fluctuations of two identical and co-located 40m long interferometers. This technique produces sensitivities better than two orders of magnitude below the quantum shot-noise limit, within integration times of less than 1 hour. Limits are placed on the strain amplitude of MHz frequency gravitational waves at the $10^{-21}\mathrm{Hz}^{-1/2}$ level, constituting the best direct limits to date at these frequencies. In this talk, I will discuss the detector technology, the data analysis, and the gravitational wave limit results.

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