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## A Tunable Resonant Detector for Low Frequency Gravitational Waves

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All practical proposals to detect low frequency gravitational waves in the frequency range 0.001 Hz to 0.1 Hz involve multi-satellite spaceborne devices with laser interferometry over very large distances. Here I outline the concept study of a single resonant interferometer detector operating within a single drag-free satellite, capable of strain sensitivity better than  $10^{-20}/\sqrt{\text{Hz}}$  for gravitational waves in the frequency range 0.001 Hz to 0.1 Hz. The resonance frequency and bandwidth are optically tunable, enabling continuous tracking of slowly evolving massive BH binary sources emitting in this frequency range. The interferometer operates in the Fabry-Perot mode with weakly coupled mass-mirrors with low resonance frequency and high Q, and a near-resonant auxiliary laser tunes the frequency using optical spring effect. The F-P cavity and moderate Q enables resonant strain sensitivity about  $10^{-20}/\sqrt{\text{Hz}}$  and tunability enables resonant tracking for long integration.

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