

Multi-carrier optimization of future laser gravitational-wave detectors

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Sensitivity of second generation of GW detectors will be quantum noise limited. In this project we assume two main methods to improve the sensitivity: the first approach comprise the use of double optical spring in order to increase the dynamical response of test objects to gravitational wave. The effect is called "negative optical inertia" and it allows to reduce total quantum noise in low frequency band. The second method is based on use of double antisymmetric carriers in order to reach high frequency improvement. We propose to combine two method mentioned above in the xylophone configuration to achieve better broadband sensitivity.