

Abstract Submitted
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Requirement for and characterization of electro-optic modulators for next-generation gravitational wave detector¹ WAN WU, VOLKER QUETSCHKE, IRA THORPE, RODRIGO DELGADILLO, GUIDO MUELLER, DAVID REITZE, DAVID TANNER, University of Florida, UNIVERSITY OF FLORIDA LIGO TEAM — Advanced LIGO is going to have a factor of 10 better strain sensitivity than LIGO through the planned instrument modification and detection scheme optimization. Advanced LIGO's dual recycling optical configuration provides us the ability to detune the signal recycling cavity to achieve much better sensitivity for particular signal sources. However, the complex interferometer configuration plus the proposed application of a high power laser in order to improve the shot noise sensitivity will impose stringent requirement on laser intensity noise, which leads to a higher technical standard of the core optical components such as the electro-optic phase modulator (EOM) in the input optics part. The modulation index variation of the EOM will create laser intensity noise on the carrier light which is going to be used to sense the motion of arm cavities in the DC sensing scheme. This talk will present the stability requirement on the modulation index of the Advanced LIGO EOM and the technique developed to measure the extra amplitude and phase noises generated by the EOM.

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