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Measurement of residual amplitude modulation in the electro-optic modulator for Advanced LIGO WAN WU, GUIDO MUELLER, DAVID REITZE, DAVID TANNER, University of Florida — The Laser Interferometer Gravitational Wave Observatory (LIGO) is designed to measure the infinitesimal distortions of space created by the motion of massive astronomical bodies. The interferometer consists of several Fabry-Perot cavities which are sensed and controlled with extremely high precision using heterodyne methods based on the Pound-Drever-Hall scheme. An electro-optic modulator (EOM) is a key component for the implementation of these shemes. The residual amplitude modulation produced by the phase modulator can produce a DC signal detected at the antisymmetric port of the LIGO interferometer. It is indistinguishable from the signature of the arm cavity length. The limitation on the arm length difference thus put an upper limit on the fractional field amplitude modulation. I will talk about the experiment to measure the amplitude modulation of the new 180 MHz resonant circuit modulator that was propsed to be used for the Advanced LIGO, the upgraded version of LIGO.

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