

Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Cavity alignment using fringe scanning¹ LAURA PAULINA SINKUNAITE, INFN/ University of Milano-Bicocca, KEITA KAWABE, MICHAEL LANDRY, LIGO Hanford Observatory — LIGO employs two 4-km long FabryProt arm cavities, which need to be aligned in order for an interferometer to be locked on a TEM00 mode. Once the cavity is locked, alignment signals can be derived from wave-front sensors which measure the TEM01 mode content. However, the alignment state is not always good enough for locking on TEM00. Even when this is the case, the alignment can be evaluated using a free swinging cavity, that shows flashes when higher-order modes become resonant. By moving test masses, small changes are made to the mirror orientation, and hence the TEM00 mode can be optimized iteratively. Currently, this is a manual procedure, and thus it is very time-consuming. Therefore, this project is aimed to study another possible way to lock the cavity on the TEM00 mode. Misalignment information can also be extracted from the power of the higher-order modes transmitted through the cavity. This talk will present an algorithm for this alternative and faster way to derive the alignment state of the arm cavities.

¹Supported by APS FIP, NSF, and Caltech SFP.

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Date submitted: 23 Sep 2016

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