



LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

RECORD OF DECISION/AGREEMENT (RODA)

Document	LIGO-M 040189-00 -Y
Date:	20 June 2004
Title:	RODA: Output Mode Cleaner to be a monolithic cavity
To the Attention of:	Advanced LIGO Systems Group SUS: Ken Strain, Justin Greenhalgh AOS: Phil Willems
cc:	aligo_systems, aligo_sus, aligo_aos
From/signatories:	Name/Title: Peter Fritschel (Systems Scientist) Signature: _____ Name/Title: Dennis Coyne (Systems Engineer) Signature: _____ Name/Title: _____ Signature: _____
System(s) affected:	<input type="checkbox"/> Initial LIGO <input checked="" type="checkbox"/> Advanced LIGO <input type="checkbox"/> Other: _____
Nature/Scope:	<input checked="" type="checkbox"/> Design Decision <input type="checkbox"/> Requirements Decision <input type="checkbox"/> Work Scope Decision <input type="checkbox"/> Working Agreement between Groups <input type="checkbox"/> Other _____
Subsystem(s) affected	<input checked="" type="checkbox"/> Relevant Subsystem(s)/Component(s): Suspensions (SUS); Auxiliary Optics subsystem (AOS); Interferometer Sensing & Control (ISC); (potentially) Seismic (SEI) Output beam reducing telescope; HAM chambers needing vibration isolation; OMC suspension system
Primary Contacts	Group or Affiliation and Contact ISC, Peter Fritschel
Reference Documents:	Advanced LIGO Sensing and Control; Readout schemes for Advanced LIGO; Ken Strain; G030076&G030077

DECISION/AGREEMENT STATEMENT:

The baseline configuration/design called for an output mode cleaner (OMC) that was essentially a copy of the input mode cleaner: a triangular cavity, with 3 individually triple-suspended mirrors, having length equal to the input MC (16m); this would allow rf modulation sidebands to pass through the OMC. However, the GW channel readout will use homodyne (DC) detection, rather than heterodyne detection. In this case, the preferred OMC design is a shorter (~1/2 m), monolithic cavity. Thus, the 3 triple-suspension OMC mirrors are removed from the baseline design.

The ISC subsystem will design the monolithic OMC and determine its vibration isolation requirements. The OMC suspension (likely a one- or two-stage suspension) will be designed by SUS. The optics for mode matching into the OMC will be designed by AOS.