



LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY
RECORD OF DECISION/AGREEMENT (RODA)

Document	LIGO-M 060308-00 -Y
Date:	October 6, 2006
Title:	RODA: MOPA to be Front-End of High Power Laser
To the Attention of:	aligo_psl
cc:	aligo_sys
From/signatories:	Name/Title: Peter Fritschel, System Scientist Signature: _____ Name/Title: Benno Willke, PSL Leader Signature: _____ Name/Title: Peter King, US PSL leader 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 checked="" type="checkbox"/> Other: Enhanced LIGO
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): PSL
Primary Contacts	Group or Affiliation and Contact: Benno Wilke, PSL
Reference Documents:	<i>Advanced LIGO PSL front end: Amplifier vs Oscillator, T060235, Advanced LIGO Pre-stabilized Laser Conceptual Design Document, T050035. AdvLIGO Laser Status, G060112. Nd:YVO4 Amplifier System, G060113.</i>

DECISION/AGREEMENT STATEMENT:

The current documented design of the Advanced LIGO laser (T050032) specifies a 12 W injection-locked ring laser as the front end for the injection-locked, high-power oscillator. An alternative front-end has been developed at Laser-Zentrum Hanover (LZH): a master oscillator-power amplifier (MOPA) combination, using a 2 W NPRO as the master, and 4 Nd:YVO₄ amplifier rods. The MOPA emits approximately 35 W. A comparison of the performance of the 12W oscillator and the 35w amplifier can be found in T060235. The high-power laser fed by this MOPA front end is expected to meet all design requirements for the laser, as given in T050036. As the MOPA is simpler and provides more power than the oscillator, the baseline laser design is hereby changed to use the '35 W' MOPA as the front-end.