



*LIGO Laboratory / LIGO Scientific Collaboration*

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Advanced LIGO

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Nominal ALS Frequencies

Daniel Sigg

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LIGO Scientific Collaboration

This is an internal working note  
of the LIGO Laboratory.

**California Institute of Technology**  
**LIGO Project – MS 18-34**  
**1200 E. California Blvd.**  
**Pasadena, CA 91125**  
Phone (626) 395-2129  
Fax (626) 304-9834  
E-mail: info@ligo.caltech.edu

**Massachusetts Institute of Technology**  
**LIGO Project – NW22-295**  
**185 Albany St**  
**Cambridge, MA 02139**  
Phone (617) 253-4824  
Fax (617) 253-7014  
E-mail: info@ligo.mit.edu

**LIGO Hanford Observatory**  
**P.O. Box 159**  
**Richland WA 99352**  
Phone 509-372-8106  
Fax 509-372-8137

**LIGO Livingston Observatory**  
**P.O. Box 940**  
**Livingston, LA 70754**  
Phone 225-686-3100  
Fax 225-686-7189

<http://www.ligo.caltech.edu/>

The nominal frequency of the PSL/IMC VCO and the fiber AOM driver is 79'200'000 Hz. The AOM drive is provided by an RF source and is fixed. All ALS VCOs (EX/EY, COMM, DIFF) are set to a nominal frequency of 78'920'000 Hz.

| <b>Nominal ALS frequencies at 532 nm</b> |                              |  |
|--|------------------------------|--|
| <b>Location</b>                          | <b>Frequency (Hz)</b>        | <b>Comment</b>                         |
| Fiber                                    | $-79'200'000 \times 4$       | Downshift                              |
| PSL                                      | $-79'200'000 \times 4$       | downshift, laser relative to ref. cav. |
| EX laser                                 | $-78'920'000 + \text{fiber}$ | relative downshift                     |
| EY laser                                 | $+78'920'000 + \text{fiber}$ | relative upshift                       |
| COMM VCO                                 | $+78'920'000$                |  |
| DIFF VCO                                 | $+78'920'000$                |  |
| Beat EX/laser                            | $-78'920'000$                | fiber - PSL + EX laser                 |
| Beat EY/laser                            | $+78'920'000$                | fiber - PSL + EY laser                 |
| Beat EY/EX                               | $+157'840'000$               | EY laser - EX laser                    |
| EX invariant                             | 0                            | fiber - PSL + EX laser + COMM VCO      |
| EY invariant                             | 0                            | fiber - PSL + EY laser - COMM VCO      |
| DIFF invariant                           | 0                            | EY laser - EX laser - DIFF VCO         |