MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Laser Interferometer Gravitational Wave Observatory (LIGO) Project

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Subject: **Spot check of coated glass viewport reflectances**

Mike, Dave--

Last April, you anticipated we might need to provide "low-quality" ports to stand in for the optically flat beam I/O ports, which weren't expected to be ready for the 2k IO integration. We've now got the smaller (5.38" view diameter, Corning 7056 glass) ports at Caltech and I had Yehuda send out a sample of each coating type for testing; here are the results. They meet ISC specs OK and so I've authorized Yehuda to proceed with cleaning and vacuum bake (we will also proceed to order the remaining ports for Louisiana).

Entries are reflectances, tested at the 633 nm and 1064 nm (the nominal visible coating center wavelength was 635 nm, but HeNe should be close enough). S1 is the side toward the knife edge seal, S2 is the "outside" surface. I chose 11^o incidence instead of normal to properly separate the two reflections. At this level of precision the absorption + scatter were not measurable; anecdotally, I did not see much of a "pencil" beam inside the glass (visually at 633, with a CCD camera for the IR). Let me know if you have any questions.

item (MDC P/N)	test λ	face	11^o S	45^o S	11^o P	45^o P
VP-800-AR635	633 nm	S1	0.47%	3.7%	0.40%	0.34%
VP-800-AR635	633 nm	S2	0.26%	2.0%	0.18%	0.20%
VP-800-AR1065	1064 nm	S1	0.51%	3.4%	0.47%	0.33%
VP-800-AR1065	1064 nm	S2	0.68%	1.3%	0.66%	0.03%

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