



Physics > Optics

# Large-angle scattered light measurements for quantum-noise filter cavity design studies

Fabian Magaña-Sandoval, Rana Adhikari, Valera Frolov, Jan Harms, Jacqueline Lee, Shannon Sankar, Peter R. Saulson, Joshua R. Smith

(Submitted on 11 Apr 2012)

Optical loss from scattered light could limit the performance of quantum-noise filter cavities being considered for an upgrade to the Advanced LIGO gravitational-wave detectors. This paper describes imaging scatterometer measurements of the large-angle scattered light from two high-quality sample optics, a high reflector and a beam splitter. These optics are each superpolished fused silica substrates with silica:tantala dielectric coatings. They represent the current state-of-the-art optical technology for use in filter cavities. We present angle-resolved scatter values and integrate these to estimate the total scatter over the measured angles. We find that the total integrated light scattered into larger angles can be as small as 4 ppm.

Comments: 11 pages, 9 figures

Subjects: **Optics (physics.optics)**; General Relativity and Quantum Cosmology (gr-qc)

Report number: LIGO document: LIGO-P1200030

Cite as: [arXiv:1204.2528v1](https://arxiv.org/abs/1204.2528v1) [physics.optics]

## Submission history

From: Fabian Magana-Sandoval [[view email](#)]

[v1] Wed, 11 Apr 2012 19:18:43 GMT (1810kb,D)

*Which authors of this paper are endorsers?*

## Download:

- [PDF](#)
- [Other formats](#)

Current browse context:

[physics.optics](#)

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1204](#)

Change to browse by:

[gr-qc](#)

[physics](#)

## References & Citations

- [NASA ADS](#)

## Bookmark (what is this?)

