

Scattered Light Noise in LIGO II

- Beam tube scattered light
 - Arm cavity baffles designed for LIGO II power levels
 - assumes LIGO II optics are superpolished

- Dark port scattered light

$$\frac{S_{SC}}{S_{\phi SRD}} \sim \sqrt{\frac{P_{SC}}{P_{BS}}} \cdot \frac{1}{\delta\phi_{SRD}}$$

- caused by backscatter of carrier light from dark port photodiode
- depends on contrast defect: optics quality, thermal distortion, etc.
- signal recycling mirror will attenuate noise by $T_{SR} \sim 0.1$
- suspended, in-vacuum photodetector will greatly reduce noise (if necessary)