

Summary: Post-O5 LIGO with Crystalline Coatings

Thermo-optically optimized, crystalline GaAs/AlGaAs mirror coatings:

- Extremely low optical losses [Scatter < 5 ppm, Absorption < 1 ppm],
- Extremely low coating thermal noise [5-10x lower than aLIGO],
- Allows RT Post-O5 upgrade with impressive sensitivity gains.

Proposed new ALS system would use 940 nm beam phase-locked to 1064 beam via Optical Frequency Comb.

\$22M required to scale coatings to 30 cm and test them.

Strain sensitivity limit < 10^{-24} Hz^{-1/2} from 80–800 Hz.

