## **Optimal Beam Expansion Telescope Design**

Beam expansion telescopes are required to match the coherent and squeeze fields generated in small crystals, to the ~km long optical cavities used in gravitational wave detection. To match any complex beam parameter to another, there are many possible solutions. These solutions have different robustness to focal length and positioning errors. In the context of the design of new gravitational wave detectors, I reconsider this general problem and derive which classes of solutions are minimally sensitive to errors.

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Track Classification: Instrument Science (ISB): Interferometer