An Optimized Interferometer for HSRL Applications

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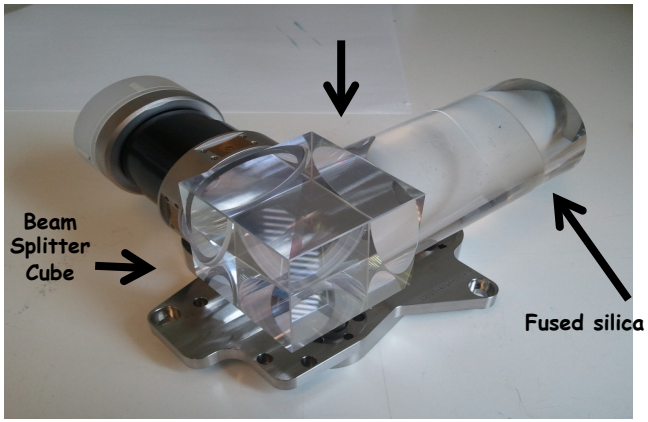
Objective

- Develop a field-widened, off-axis Michelson interferometer needed for the high resolution 355 nm channel of the High Spectral Resolution Lidar (HSRL) that :
  - is temperature insensitive and more robust mechanically,
  - has fewer degrees of freedom, simplifying operations and calibration,
  - allows for higher measurement accuracy.

"Air Arm" made of 5 cylindrical segments:
Fused silica – Invar – Al – Invar – Fused Silica



Field-widened, off-axis Michelson Interferometer

Accomplishments

- Developed new design for interferometer and thermal housing design to replace current HSRL-2 interferometer for ER-2 test flights.
- Utilized temperature matched optical materials to alleviate issues from thermal stresses
- Conducted STOP analysis (Structural Thermal OPtical analysis) to guide operational considerations and design for space

Co-Is/Partners:
LightMachinery; Wayne Welch, Welch Mechanical

$TRL_{in} = 3$; $TRL_{out} = 4$