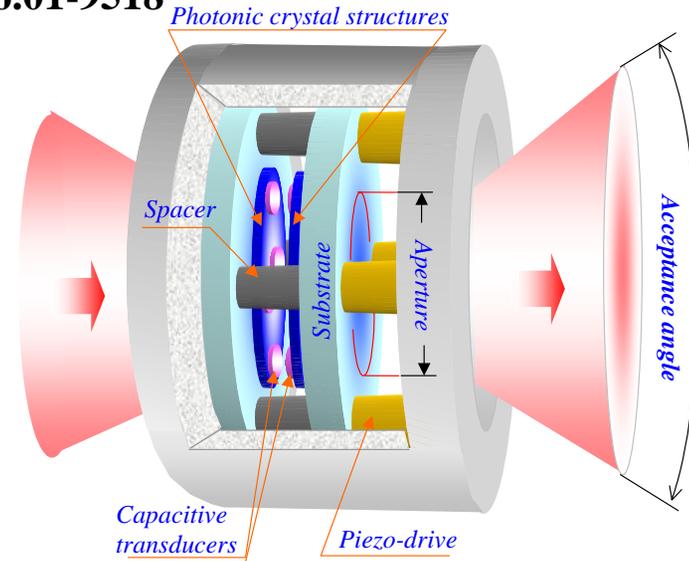


One-Dimensional Tunable Photonic-Crystal IR Filter

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Identification and Significance of Innovation

- Photonic crystals-based tunable IR bandpass filter.
- Bandpass $< 0.1 \text{ cm}^{-1}$; tunability range $\leq 10 \text{ cm}^{-1}$; acceptance angle $> 1^\circ$; background rejection $< 30 \text{ dB}$; aperture $\sim 1 \text{ inch}$.
- Electronically controlled transmission wavelength tuning.
- High compactness and ruggedness.



Technical Objectives and Work Plan

- Demonstrate the feasibility of an ultra-narrow tunable optical bandpass filter.
- Demonstrate that an optical filter based on specific features of photonic crystals can provide the estimated characteristics.
- Analyze the filter performance and select optimal structure parameters.
- Arrive at preliminary design of an ultra narrow tunable optical bandpass filter.

NASA and Non-NASA Applications

- Expand capabilities of NASA's Earth Science Enterprise:
 - high resolution multi-spectral imaging
 - high accuracy measurements of atmospheric and surface parameters from space and airborne platforms
- Wide range of commercial applications:
 - Combustion diagnostics, spectroscopic monitoring

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