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IR spectroscopy with pyrolytic carbon string resonator as a tool for particle detection

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INTRODUCTION

MEMS String Resonator

Pyrolytic Carbon

- Isotropic properties
- Conductive material
- Controlable properties

Pyrolytic Carbon String Resonator

Infrared Spectroscopy

Pyrolysis process

Fabrication

SU-8 Lithography

Isotropic etch

MATERIALS AND METHOD

Fabrication

SU-8 Lithography

Isotropic etch

Pyrolysis process

T1: 200°C
T2: 700°C
Ramping rate: 2°C/min
t1: 30 mins

Characterization

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CONCLUSION

We demonstrate the fabrication of the pyrolytic carbon string resonators with optimized process. The carbon string resonators are then characterized by interferometry to obtain the resonance frequency and Q factor. A resonant photothermal IR absorption measurement shows the absorption spectrum of the materials. The results show the potential of the pyrolytic carbon string resonators as a tool for particle detection.