

[# High-fidelity cavity soliton generation in crystalline AlN micro-ring resonators]

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What problem does this paper address?

- Briefly summarize the motivation and background.
- In AlN the optical thermal effect is strong, it will unstablize the soliton formation. To avoid this they utilize SSBM and OAM to fast tune the pump wavelength and power to get the soliton state avoid the thermal instability region.

What are the key methods or experimental techniques?

- Experimental setup / materials used

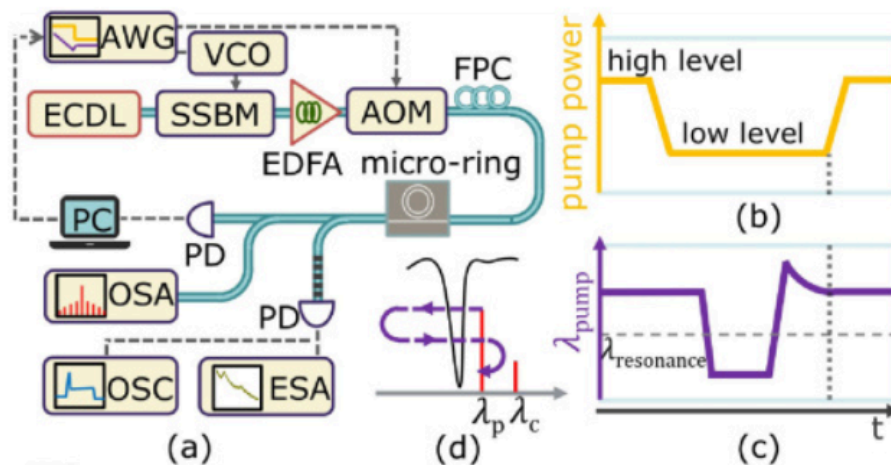


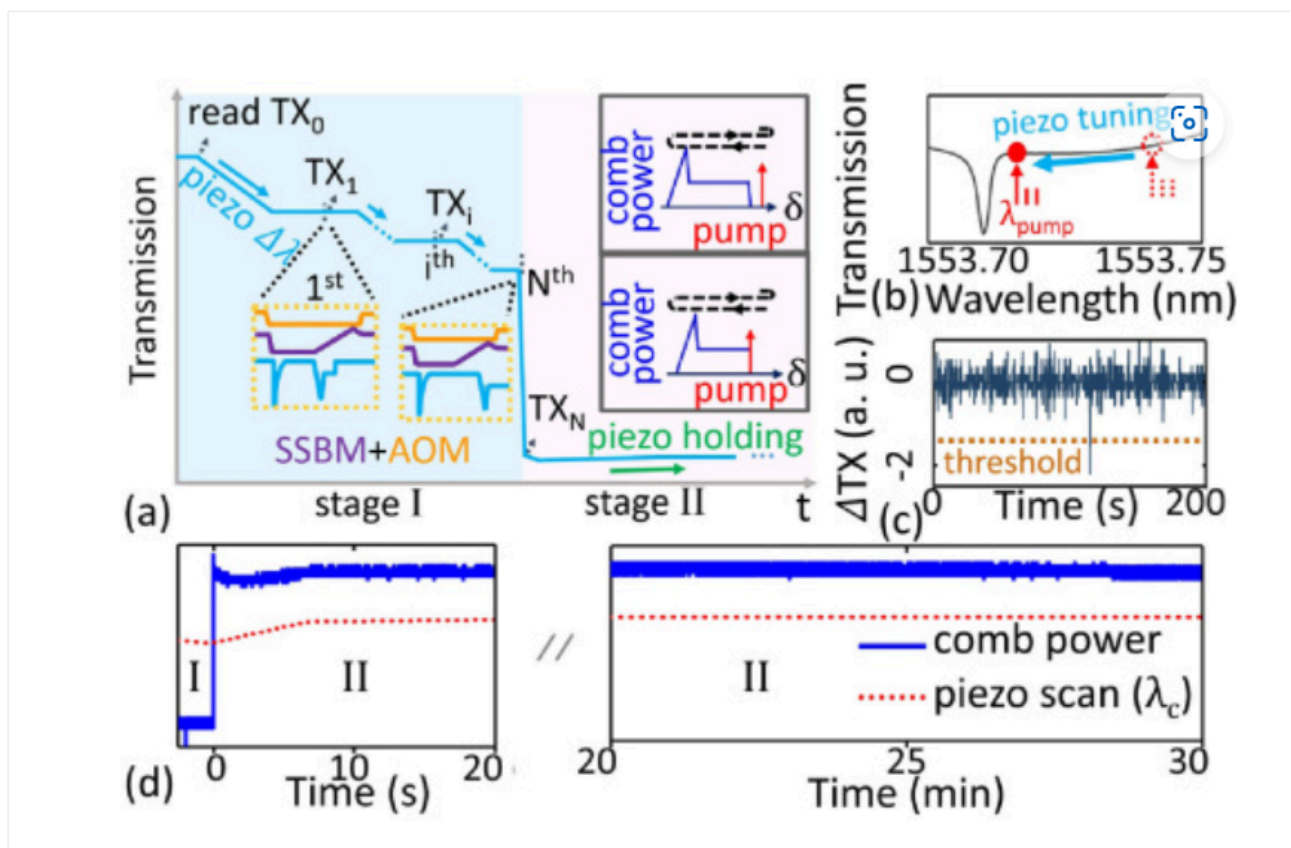
Fig. 1. (a) Experiment setup. ECDL, external cavity diode laser; SSBM, single-sideband modulator; VCO, voltage-controlled oscillator; AWG, arbitrary wave generator; EDFA, erbium-doped fiber amplifier; AOM, acousto-optic modulator; FPC, fiber polarization controller; FBG, fiber Bragg grating; PD, photodetector; OSA, optical spectrum analyzer; OSC, oscilloscope; ESA, electronic spectrum analyzer; PC, personal computer. (b) and (c) schematically show the modulated pump power and wavelength in one “SSBM + AOM” strike cycle. (d) Trajectory of pump wavelength, $\lambda_{\text{pump}}(\lambda_p)$, under the bidirectional SSBM scan in (c) across a cavity resonance.

- Theoretical model (if any)

- no expression is thermal will push the resonance to the red-detuned side and
- Key parameters or system
frequency and power tuning rate the overtune rate the power increase rate]
cavity wavelength λ_c , frequency sweep speed, back δ_{back} τ_{back} , pump power, power increase factor

What are the main results?

- What does the paper demonstrate?
- demonstrate a program to trap the field in cavity in the soliton state with a probability of 99.4%
- Any key figures (Fig. X) to note



What is novel or interesting about this work?

- Technical innovations
- frequency and power sweep program with 1 over detune and back sweep 2
- Compared to prior work, what's new?
- material system different combine SSBM and AOM

Connections to Gong Zheng's PhD thesis

- Which chapter does this relate to?
- chapter 2
- Is this part of a larger research trajectory?
- yes they then study χ^2 soliton in AlN cavity and LN

My thoughts & extensions

- Can I use this technique/idea?
- yes try to check the bidirectional soliton paper to solve the photorefractive problem
- How could I adapt this concept to my experiment or simulation?
- the fast scan can help us understand that the formation of comb is faster can be formed in a few nanosecond
- What are my questions after reading?s
- 对于LN 是否已经有稳定的soliton 观察到? ? ? 是否需要延长寿命? ? ?