

## Optomechanical cavities: from synchronization to mode locking

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Summary. We experimentally study a fiber-based optical ring cavity integrated with a mechanical resonator mirror and an optical amplifier. The device exhibits a variety of intriguing nonlinear effects including synchronization and self-excited oscillation. Passively generated optical pulses are observed when the frequency of the optical ring cavity is tuned very close to the mechanical frequency of the suspended mirror. The optical power at the threshold of this process of mechanical mode locking is found to be related to quantum noise of the optical amplifier.