

Triply-resonant Optical Parametric Oscillator by Four-wave Mixing with Rubidium Vapor inside an Optical Cavity

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We present an experimental demonstration of simultaneous above-threshold oscillations of the Stokes and anti-Stokes fields together with the single pumping beam with rubidium atoms inside an optical standing-wave cavity. The triple resonant conditions can be achieved easily by making use of the large dispersions due to two-photon transitions in the three-level atomic system.

This work provides a way to achieve high efficient nonlinear frequency conversion and the generated bright Stokes and anti-Stokes cavity output beams are potential resource for application in quantum information science.

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