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From spectral matrix to sideband structure: exploring stereo multimodes

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Abstract

We recall the details involving the generation of light beams by optical cavities in order to explore the quantum properties that are revealed from the covariance matrices of the quadratures of the fields. This consideration is necessary to reveal the structure involving the sidebands of the resonant cavity modes, their reconstruction from the linearized Hamiltonian, and the fact that, for each output beam generated from an optical cavity observed under a defined electronic analysis frequency, we access a double space of modes involving the sidebands. The full measurement of those sidebands is revisited, and the distinct techniques are compared, showing their advantages, drawbacks, and perspectives.

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