234. Title: Balanced terahertz wave air-biased-coherent-detection

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Abstract: A balanced heterodyne air-biased-coherent-detection scheme for broadband terahertz waves is achieved using third-order nonlinear susceptibility tensor elements to produce field-induced optical second harmonic photons, which have two orthogonal polarizations. The differential signal between two orthogonally polarized second harmonic photons reduces the common noise in a balanced detection geometry and improves the signal-to-noise ratio by a factor of 2.