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Title:Telecommunications technology-based terahertz sources

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Abstract:A review is presented of continuous-wave terahertz sources based on the optical heterodyne generation (photomixing) technique, that make use of optical components and fabrication techniques originally developed for the 1550nm optical fibre telecommunications window. The uni-travelling carrier photodiode is identified as a key component for conversion of optical to terahertz power, and the state of the art is summarised in terms of terahertz power generated at various frequencies. An approach based on phase locking the heterodyned lasers is described, which enables terahertz signals to be generated with extremely high spectral purity and frequency accuracy, and progress in developing the photonic integrated circuits required for its implementation is reported. Finally, possible future developments in the field are discussed.

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