

## Next Generation of the Sub-millimetre-wave Security Camera “THz-Videocam”

Torsten May<sup>1</sup>, Erik Heinz<sup>2</sup>, Katja Peiselt<sup>1</sup>, Gabriel Zieger<sup>1</sup>, Detlef Born<sup>1</sup>, Andre Krüger<sup>1</sup>,  
Torsten Krause<sup>1</sup>, Anika Brömel<sup>1</sup>, Solveig Anders<sup>1</sup> and Hans-Georg Meyer<sup>1</sup>

<sup>1</sup>Institute of Photonic Technology, Albert-Einstein Str. 9, D-07745 Jena, Germany

<sup>2</sup>Supracon AG, An der Lehmgrube 11, D-07751 Jena, Germany

E-Mail: [torsten.may@ipht-jena.de](mailto:torsten.may@ipht-jena.de)

**Abstract** - Based on the previously demonstrated concept of passive security screening utilising superconducting detectors, a next generation camera was developed to meet application demands. The new system was designed to achieve background limited performance using a linear array of 64 transition edge sensors which are read in a time domain multiplexing scheme by SQUID current sensors. It is able to record videos with 256 x 64 pixels at 25 Hz frame rate. The necessary cooling of the detector array is provided by a commercial pulse tube cooler and a second, self-contained cooling stage. For imaging, different optics modules as a telephoto and a wide-angle objective have been realized. Both configurations are optimized for a feed-horn detector coupling and can be used in combination with a novel linear scanning apparatus for mirrors up to 40 cm. We present results obtained with a telephoto for distances up to 20 m.

**Keywords** - security, camera, video camera, passive screening, sub-millimetre wave, superconducting detector, transition edge sensor, detector array, time-domain multiplexing, linear scanning mirror