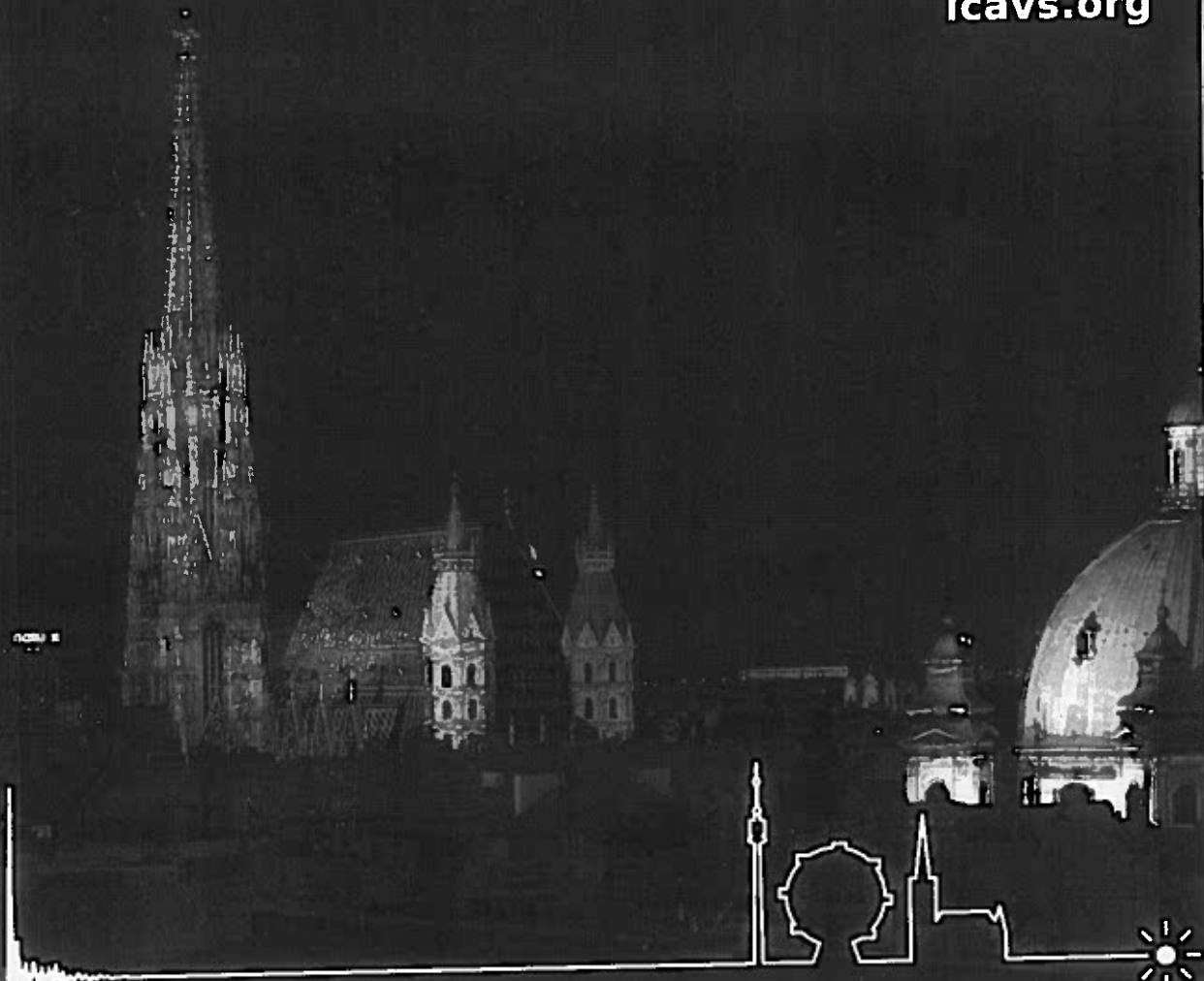


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Advances in IR Detectors

Thursday, 15:15 - 16:20
Chair: Gottfried Strasser

HS8

General Information

Program

Exhibition

Author Index

- 15:15 **MWIR Upconversion Detection for Infrared Gas Spectroscopy**
TH811-inv Armin Lambrecht, Sebastian Wolf, Johannes Herbst, Frank Kühnemann

Upconversion of infrared photons for fast and sensitive MWIR detection without cryogenic cooling has gained new interest by recent progress in solid state lasers and nonlinear optical materials. Results on laser based gas spectroscopy indicate a high potential for many mid-infrared spectroscopy applications.

- 15:35 **Quantum Cascade Detectors for Sensing Applications**
TH812 Andreas Harrer, Peter Reininger, Benedikt Schwarz, Donald MacFarland, Hermann Detz, Tobias Zederbauer, Werner Schrenk, Gottfried Strasser

A key aspect for integrated sensing is room temperature operation of the sources and detectors with sufficient performance. We demonstrate two approaches to enhance the room temperature responsivity and detectivity for mid-infrared Quantum Cascade Detectors (QCD). First a diagonal transition QCD design with the active transition between two neighboring active wells with a peak responsivity of 16.9mA/W. Second a plasmonic lens enhanced QCD with enhanced light collection and focusing, reporting a factor of 6 photocurrent increase.

- 15:50 **Room Temperature MCT Detectors for FTIR Spectroscopy**
TH813 Karolina Ogradnik, Jaroslaw Pawluczyk, Mariusz Romanis, Jozef Piotrowski

We present detection modules for sensitive and wide bandwidth detection of MWIR and LWIR radiation, that are optimized for operation at frequency bandwidth from DC to GHz range. IR detectors with improved performance and high frequency response utilizing optical immersion are reported. Recent efforts concentrated on the extension of useful spectrum range above 13 micrometers for FTIR spectrometer applications is presented.

- 16:05 **Optimum Drive Conditions for DLaTGS Pyroelectric Detectors in FTIR Applications and Its Impact on Performance**
TH814 Johannes Kunsch, Alan Doctor

Pyroelectric DLaTGS detectors are the workhorse detectors in FTIR instruments. Detector improvements will directly result in instrument improvements. We are investigating the "ideal pyroelectric FTIR detector". Due to basic considerations, current mode operation at appr. 45°C should yield best performance. Furthermore, we developed a unique connection scheme (patent pending) that increases the signal to noise of any pyroelectric detector by a factor of about 1.4. We intend to combine both approaches in order to make the "ideal" DLaTGS detector.