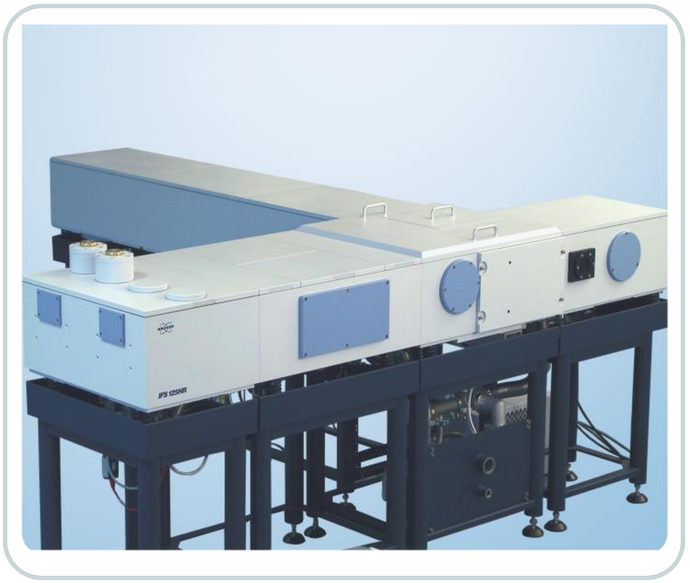
Bruker Optics Atmospheric Measurement Systems - News

IRWG/TCCON Online Meeting 2021

Bruker Optik GmbH
Ettlingen Germany

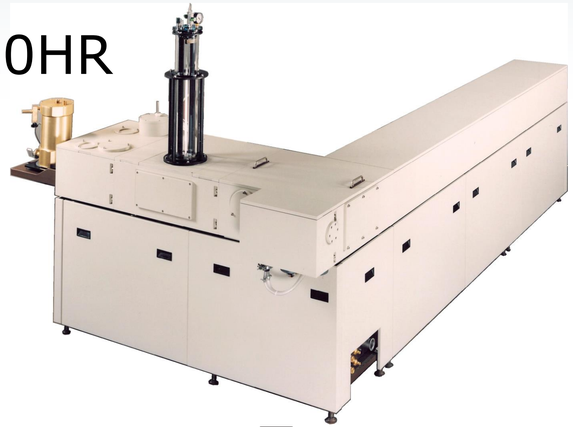
Bruker internal changes

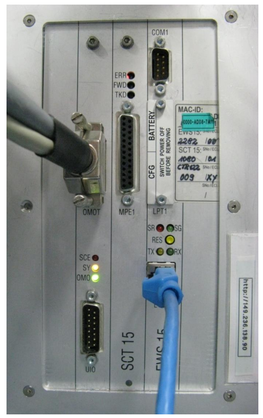


- After more than 3 decades with Bruker Axel Keens retired end of 2020
- Denis Czurlok took over response for the high resolution business in 05/2020
  - With Bruker since 01/2016
  - Application specialist for high-end R&D instruments (VERTEX80v, VERTEX70v,…)
  - Ph.D. on fs-IR-Spektroscopy of pseudohalides in acqueous solution at the University of Bonn/Germany
- Gregor Surawicz will stay responsible for service for the next years. Retirement not before 09/23, realistic option for longer availability

Important Sales information

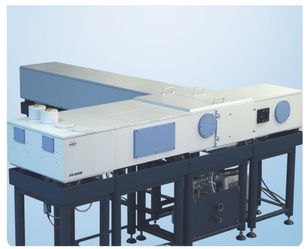
IFS120HR





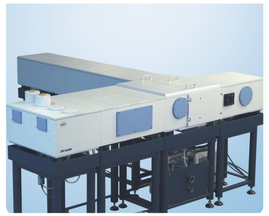
Electronic upgrade to IFS125HR electronics: E600/2

M15 electronics



I24190

M16 electronics



- Upgrade possibility discontinued in 2020
- No more orders of E600/2 possible

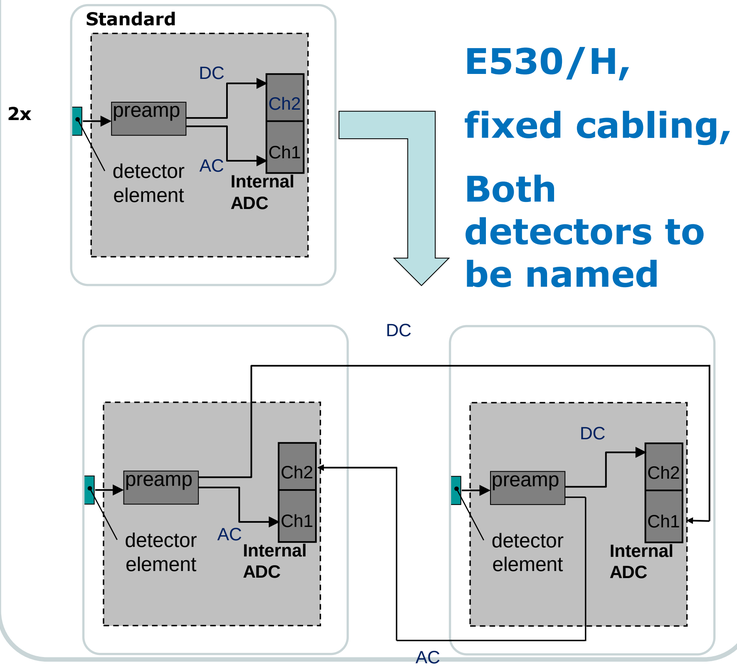
		Electronic Options
1	E600/2	Upgrade of an existing IFS120HR spectrometer to the new IFS125HR electronics, consisting of: - complete new IFS125HR electronics - new gearless drive unit - modification of last scanner chamber to accommodate the new drive unit - modification of voice coil scanner - new wiring - two E550/A adaptions for up to 4 analog detectors - ID chips for up to 6 beamsplitters (OPUS upgrade, data station and installation cost not included)

- Support of upgraded instruments at least until 2030
- Update from M15 to M16 electronics (IFS125 HR) still possible via I24190

Review on electronic options E530/H or 2x 1016756

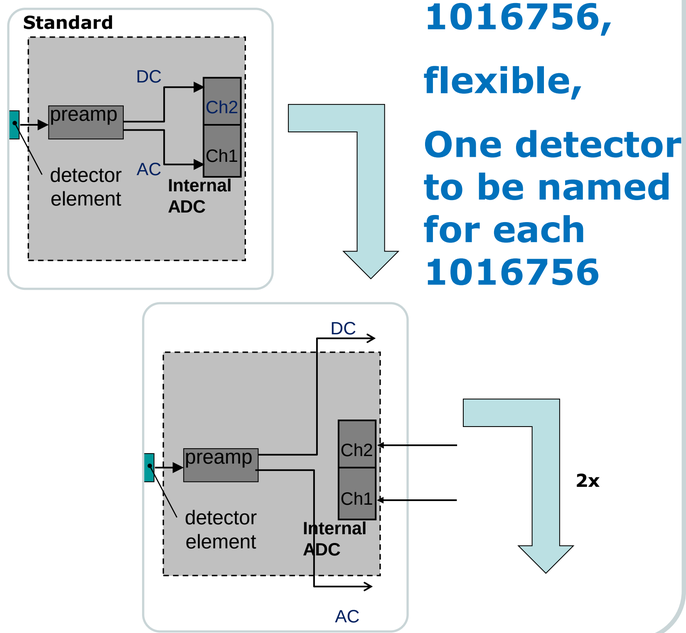
E530/H

less expensive



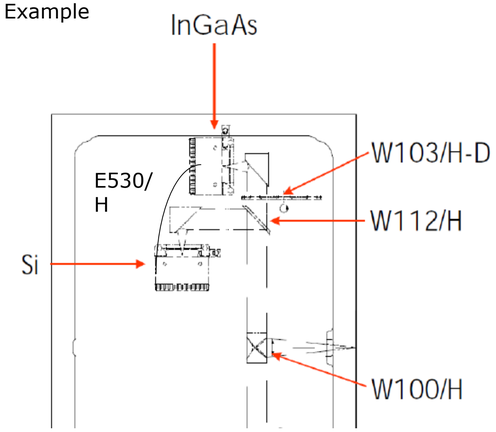
(2x)1016756

little bit more expensive, more effort



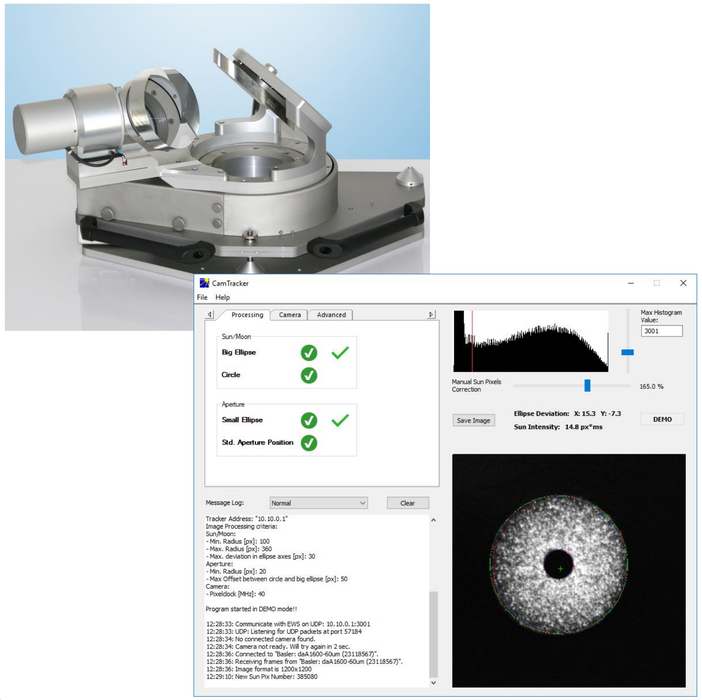
- Dual channel acquisition from two detector signals
- Both AC *or* both DC signals can be sampled simultaneously
- Dichroit option required

Example



CamTracker - News

A547N/2 Solar Tracker



- In general:
  - CamTracker operation is **standard** and included in Solar Tracker option
  - Optional (if view is obscured): Quadrant diode operation (same price)
- New camera model (USB3) and new software for CamTracker operation
- Camera and software suitable for Windows10 operation
- New parts launched and installed
- Upgrade package for existing Trackers available, service assistance might be required:

1878909 1 PC

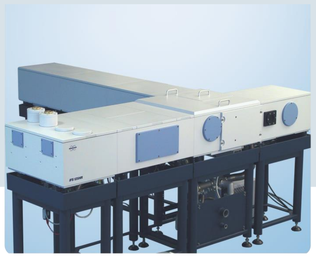
ASM CONVERSION KIT CAMERA WIN10 USB3 125

Upgrade Kit CamTracker
Upgrade kit for existing A547N/2 Solar Tracker in CamTracker operation installed before 2020.
The upgrade kit allows the operation of the A547N/2 in CamTracker mode on Win10 computers and consists of:
- New high resolution camera
-Hardware to adapt new Camera
- Win10 compatible software for CamTracker operation For IFS125HR system with:
- A547N/2 Solar Tracker in CamTracker operation installed before 2020
- W124/HU Enlarged source chamber

Required: S950-1A, quantity depends on location of the instrument

Beamsplitter - News

Increase of air-gap wedge



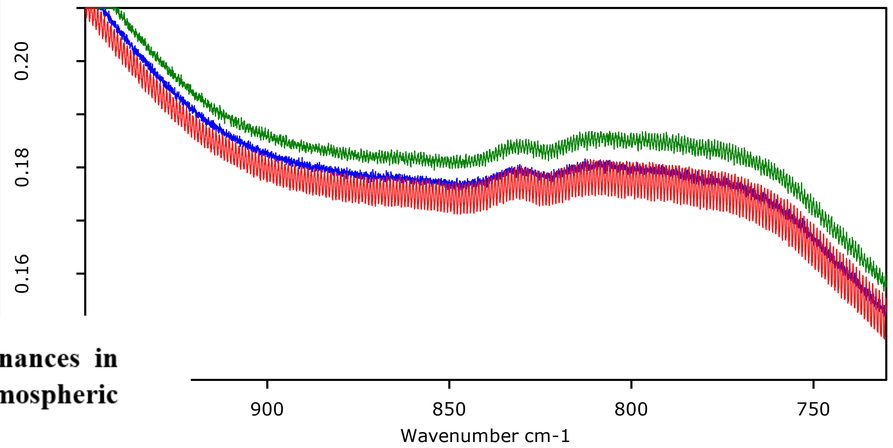
Characterisation and potential for reducing optical resonances in FTIR spectrometers of the Network for the Detection of Atmospheric Composition Change (NDACC)

Thomas Blumenstock[1], Frank Hase[1], Axel Keens[2], Denis Czurlok[2], Orfeo Colebatch[3], Omaira Garcia[4], David W. T. Griffith[5], Michel Grutter[6], James W. Hannigan[7], Pauli Heikkinen[8], Pascal Jeseck[9], Nicholas Jones[5], Rigel Kivi[8], Erik Lutsch[3], Maria Makarova[10], Hamud Kh. Imhasin[10], Johan Mellqvist[11], Isamu Morino[12], Tomoo Nagahama[13], Justus Notholt[14], Ivan Ortega[7], Mathias Palm[14], Uwe Raffalski[15], Markus Rettinger[16], John Robinson[17], Matthias Schneider[1], Christian Servais[18], Dan Smale[17], Wolfgang Stremme[6], Kimberly Strong[3], Ralf Sussmann[16], Yao Té[9], Voltaire A. Velazco[5]

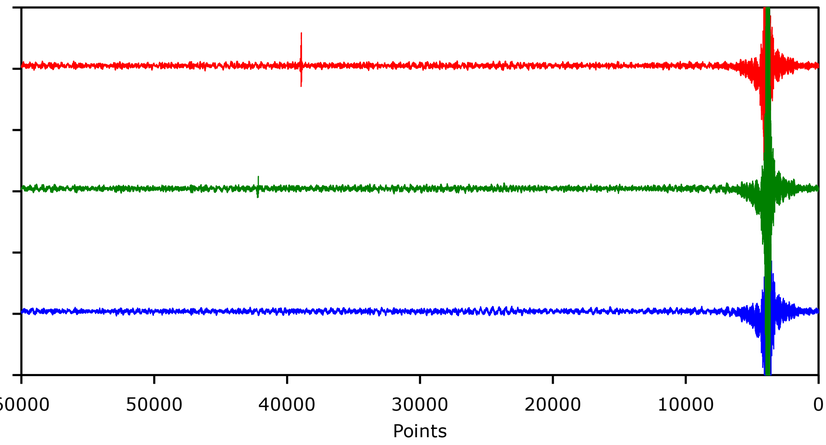
[1]Karlsruhe Institute of Technology (KIT), Institute of Meteorology and Climate Research (IMK-ASF), Karlsruhe, Germany
[2]Bruker Optics GmbH, Ettlingen, Germany
[3]Department of Physics, University of Toronto, Toronto, Canada
[4]Izaña Atmospheric Research Centre (IARC), Meteorological State Agency of Spain (AEMET), Tenerife, Spain
[5]Centre for Atmospheric Chemistry, University of Wollongong, Wollongong, Australia
[6]Centro de Ciencias de la Atmósfera, Universidad Nacional Autónoma de México (UNAM), Mexico City, México

- standard wedge (0.5°) and increased wedge (1.27°, 2.2°)

Spectra



Interferograms



Glowbar source, 0.05cm^{-1}, Apt=1.3 mm, low-pass filter 2400 cm^{-1}, D316/H, preamp B,

Beamsplitter - News

Increase of air-gap wedge

- Maximum wedge angle to maintain compatibility to other beamsplitters: 0.8°
- Maximum wedge angle that can be realized in current interferometer design: ~ 2°
- Two Measures taken:

1. Since end of 2020, 0.8° the new standard wedge angle for all BMS with air-gap (former 0.5°) (same price, feedback appreciated)
2. Special KBr or CaF2 BMS with 2° wedge angle available on request (several orders appreciated)

Beamsplitter - News

- New part defined:

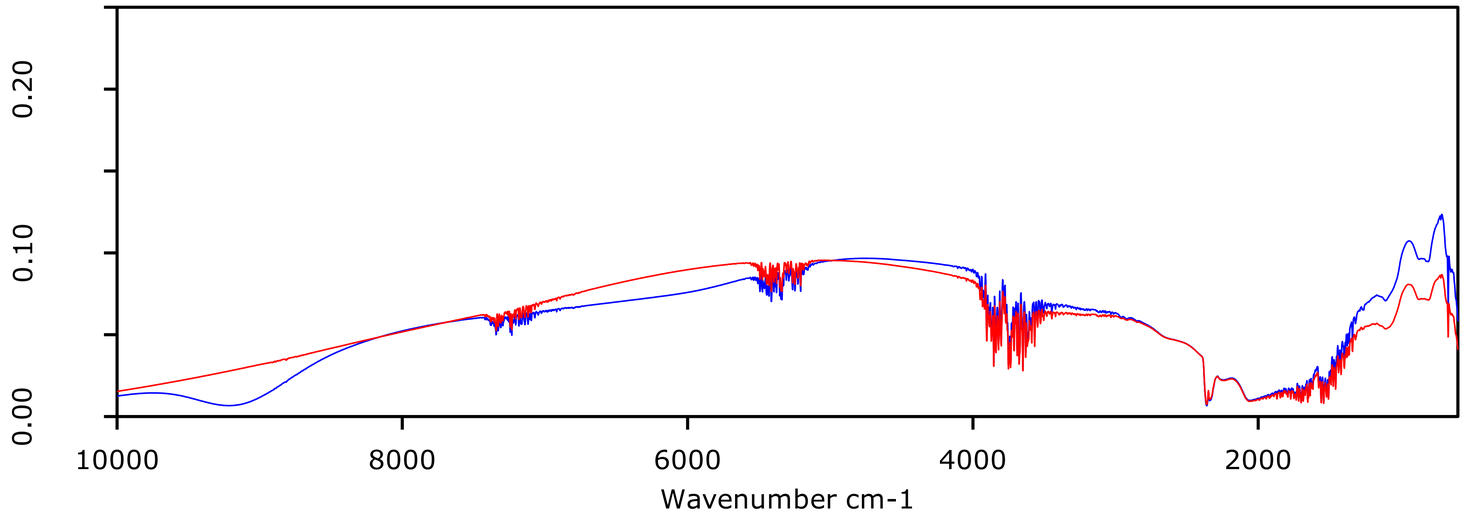
1881248
BB-BEAMSPLITTER KBR 10000-600CM-1
Broadband (KBr) beamsplitter #T304/2"
Spectral range: approx. 10,000-600cm-1
For IFS125HR spectrometer

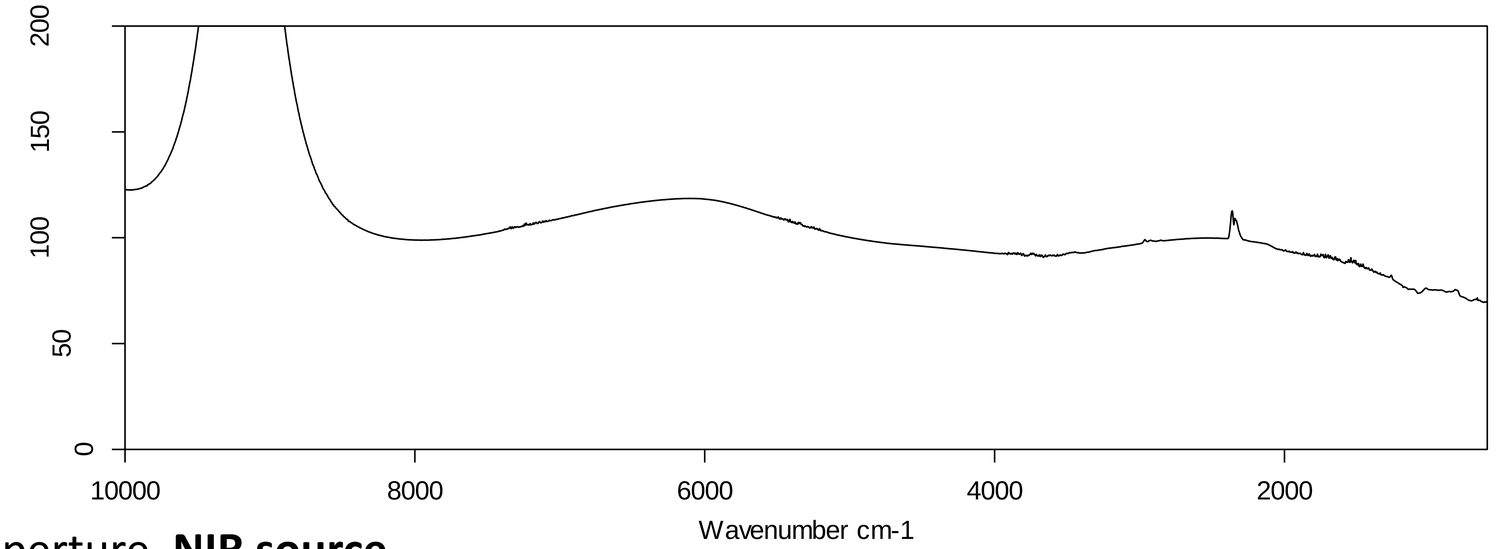
- At least 3 (or 5) orders, otherwise price unreasonable high
- initial orders placed, delivery in 2021, performance feedback appreciated

Expected from V70v studies:

- Related interferometer design, beam angle

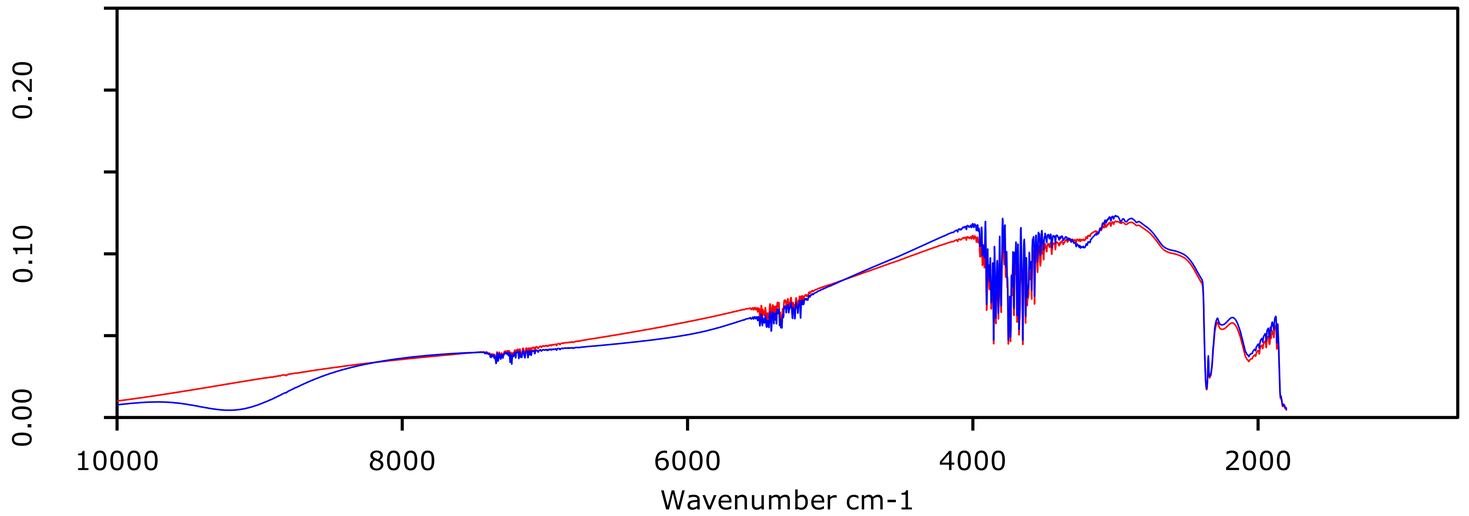
blue: Standard KBr T303/IR
red: KBr extended T304/IR
black: ratio „KBr extended“: „Standard KBr“

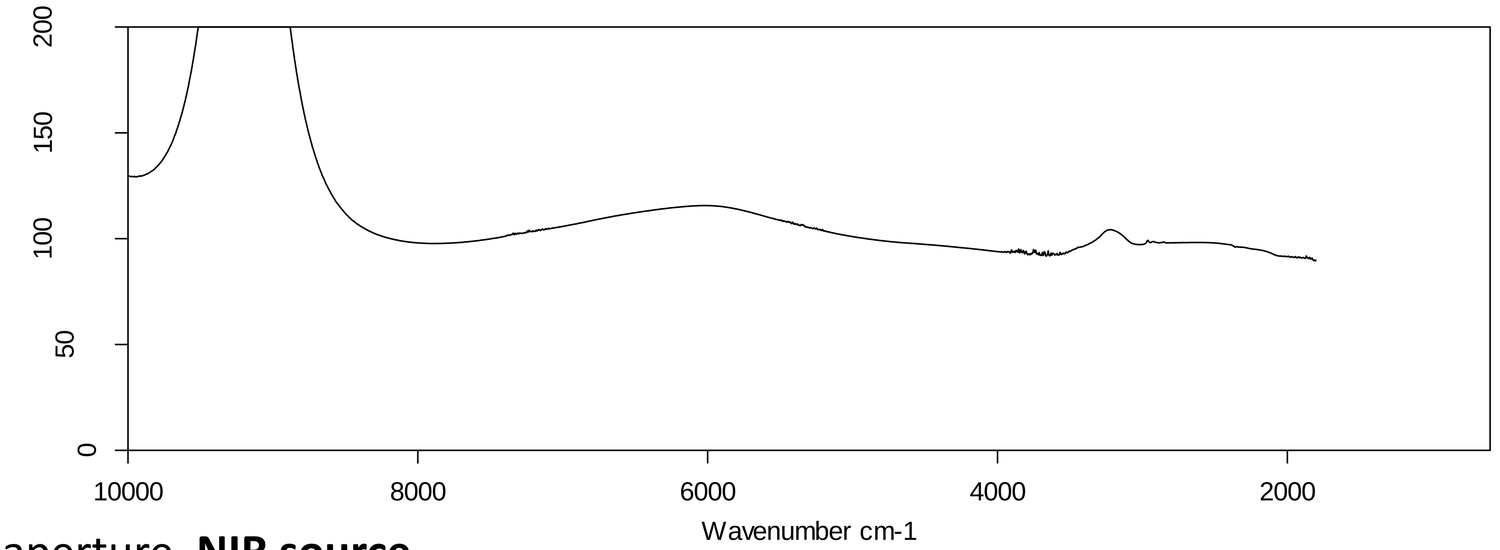




V70v, MCT detector, 0.5mm aperture, **NIR source**

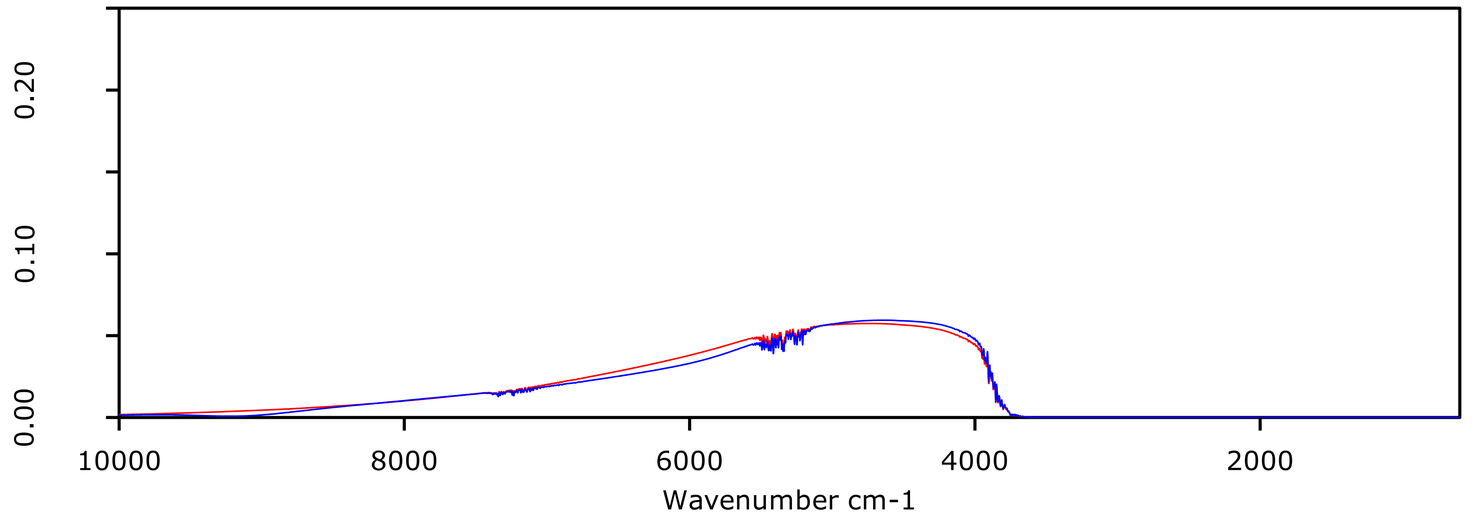
blue: Standard KBr T303/IR
red: KBr extended T304/IR
black: ratio „KBr extended“: „Standard KBr“

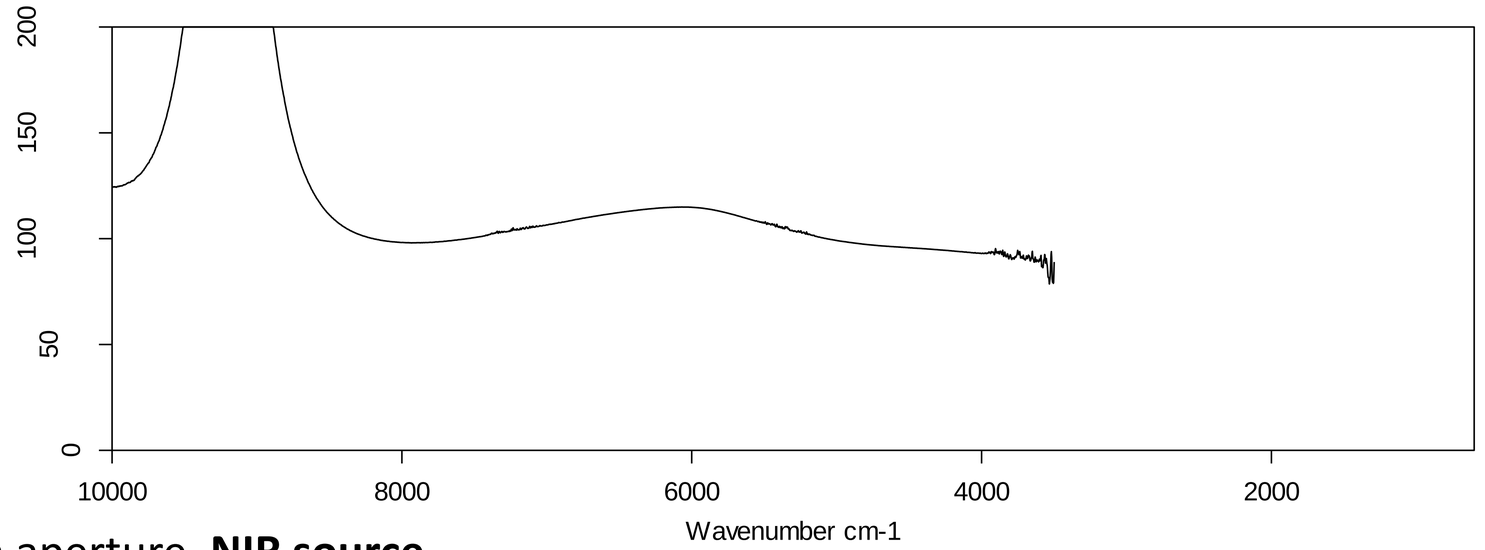




V70v, InSb detector, 0.25mm aperture, **NIR source**

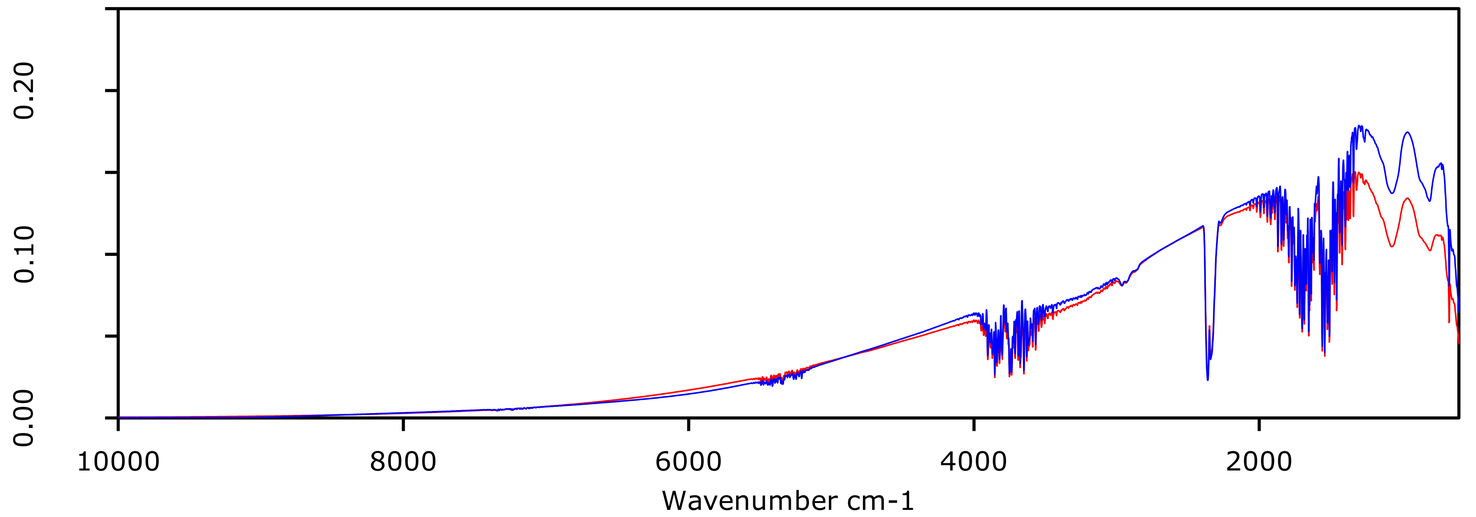
blue: Standard KBr T303/IR
red: KBr extended T304/IR
black: ratio „KBr extended“: „Standard KBr“

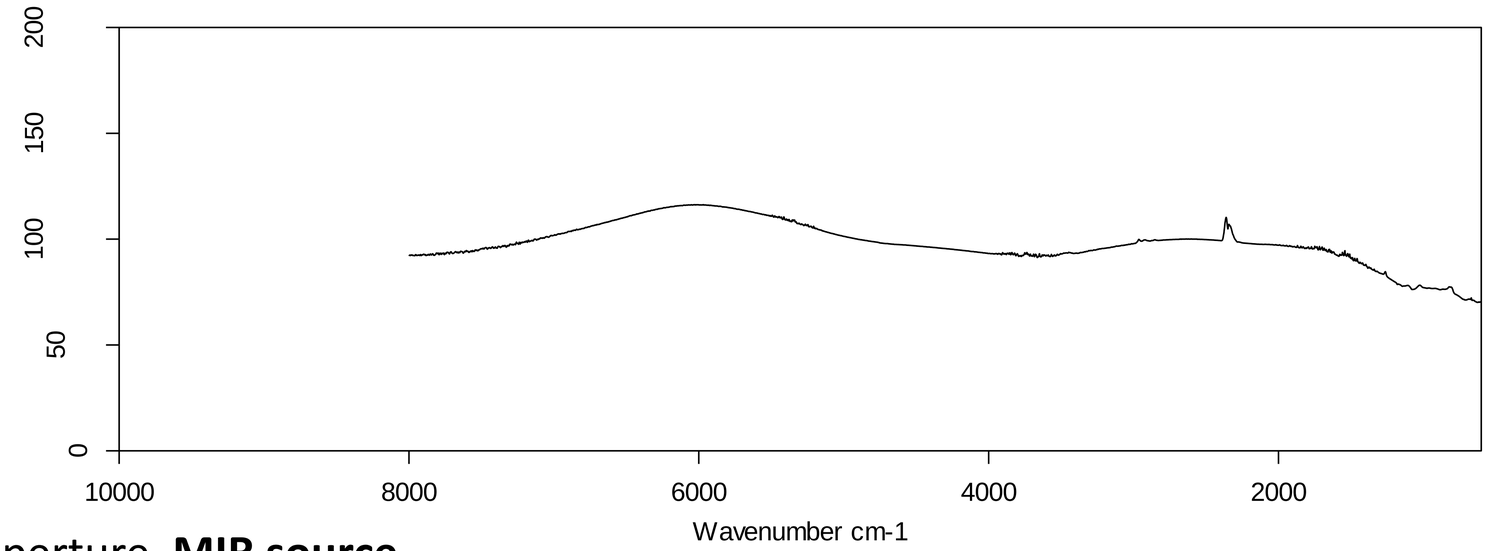




V70v, InGaAs detector, 0.5mm aperture, **NIR source**

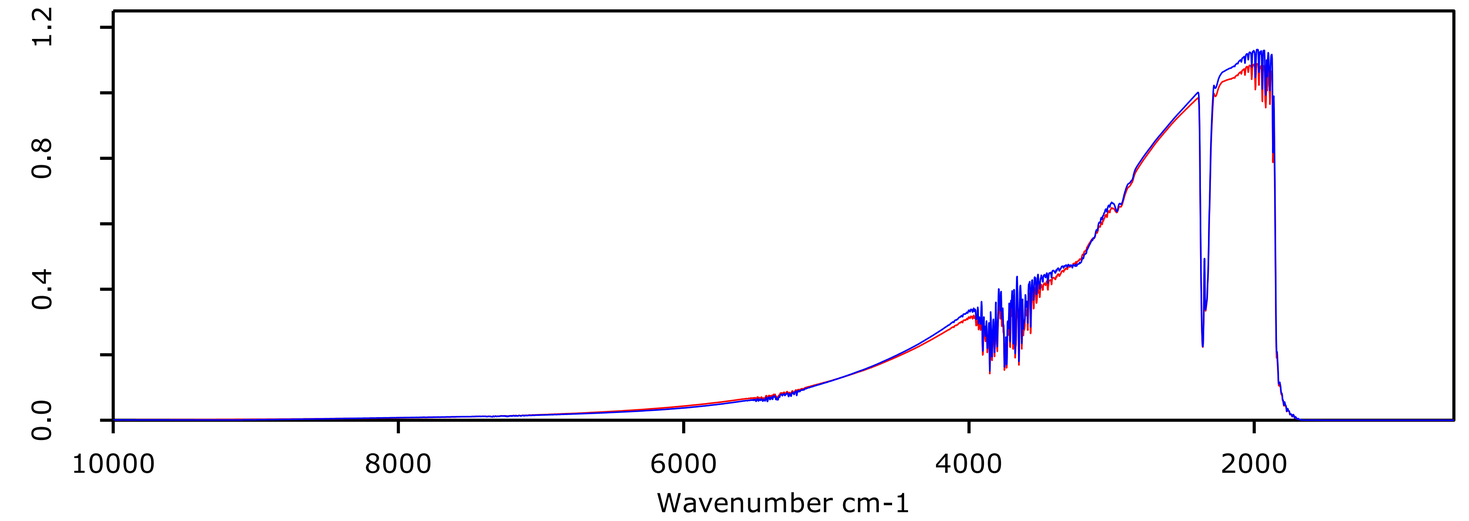
blue: Standard KBr T303/IR
red: KBr extended T304/IR
black: ratio „KBr extended“: „Standard KBr“

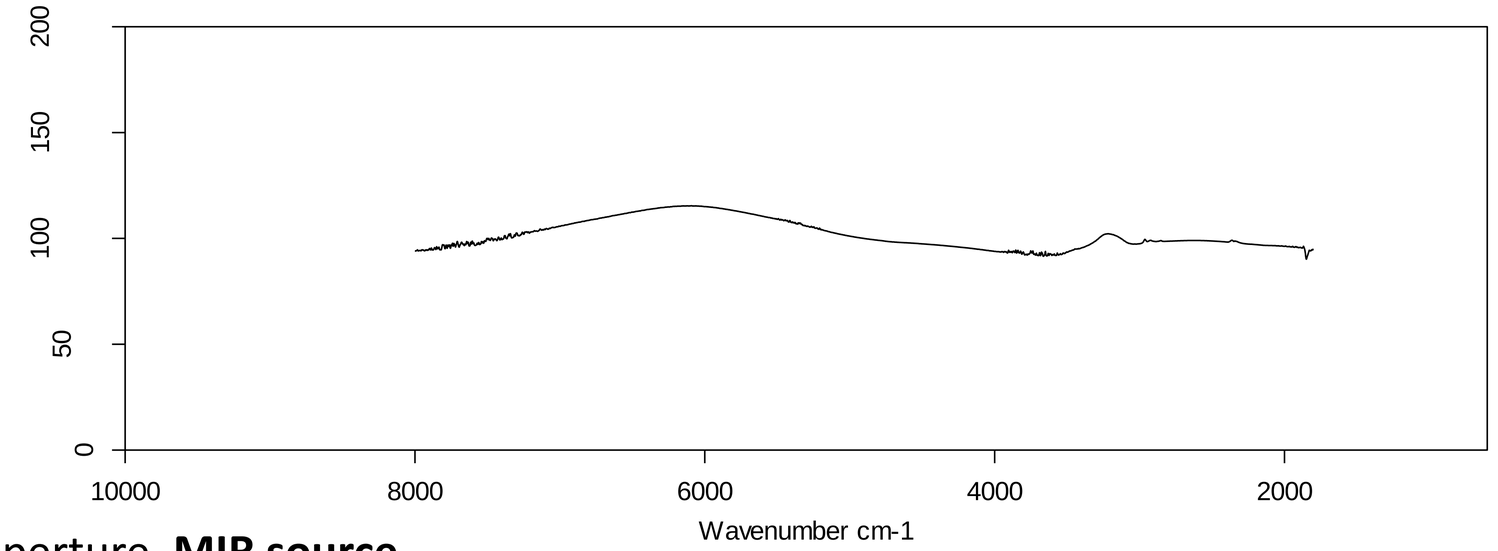




V70v, MCT detector, 0.5mm aperture, **MIR source**

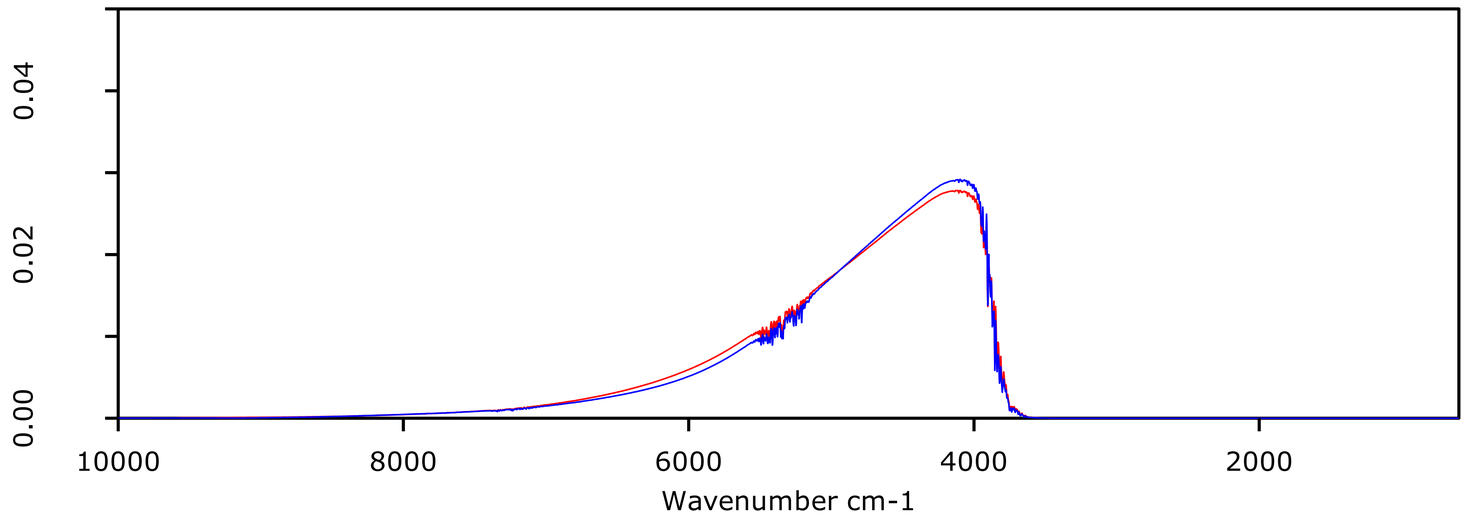
blue: Standard KBr T303/IR
red: KBr extended T304/IR
black: ratio „KBr extended“: „Standard KBr“

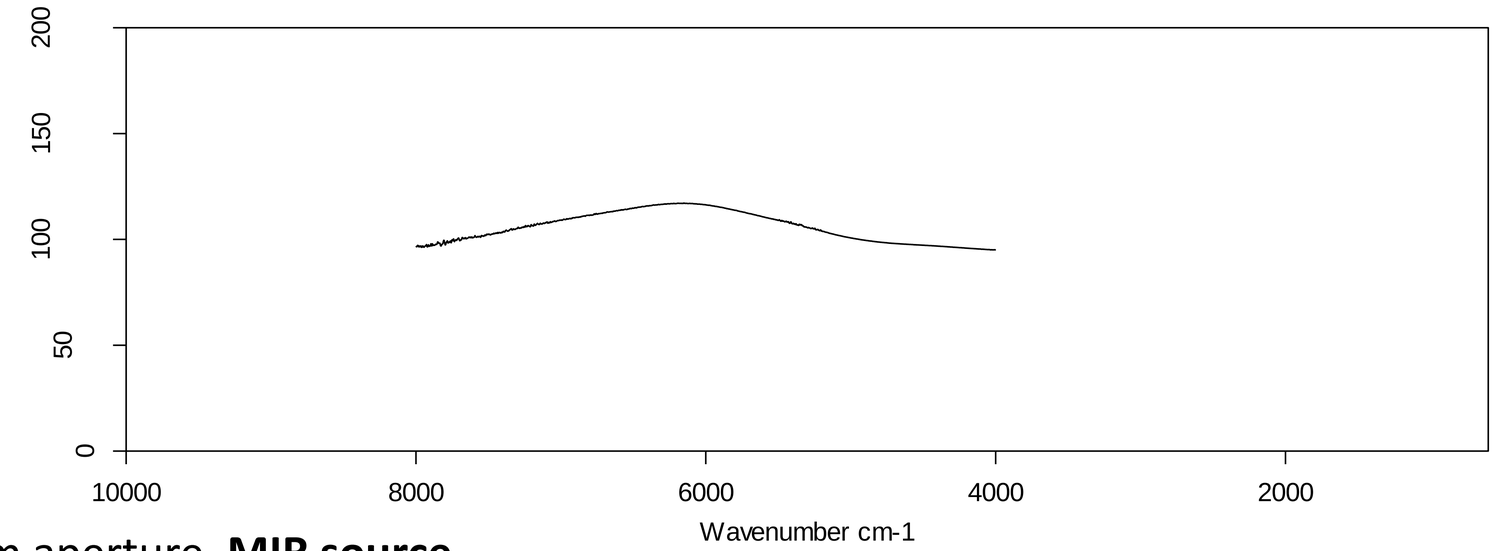




V70v, InSb detector, 0.5mm aperture, **MIR source**

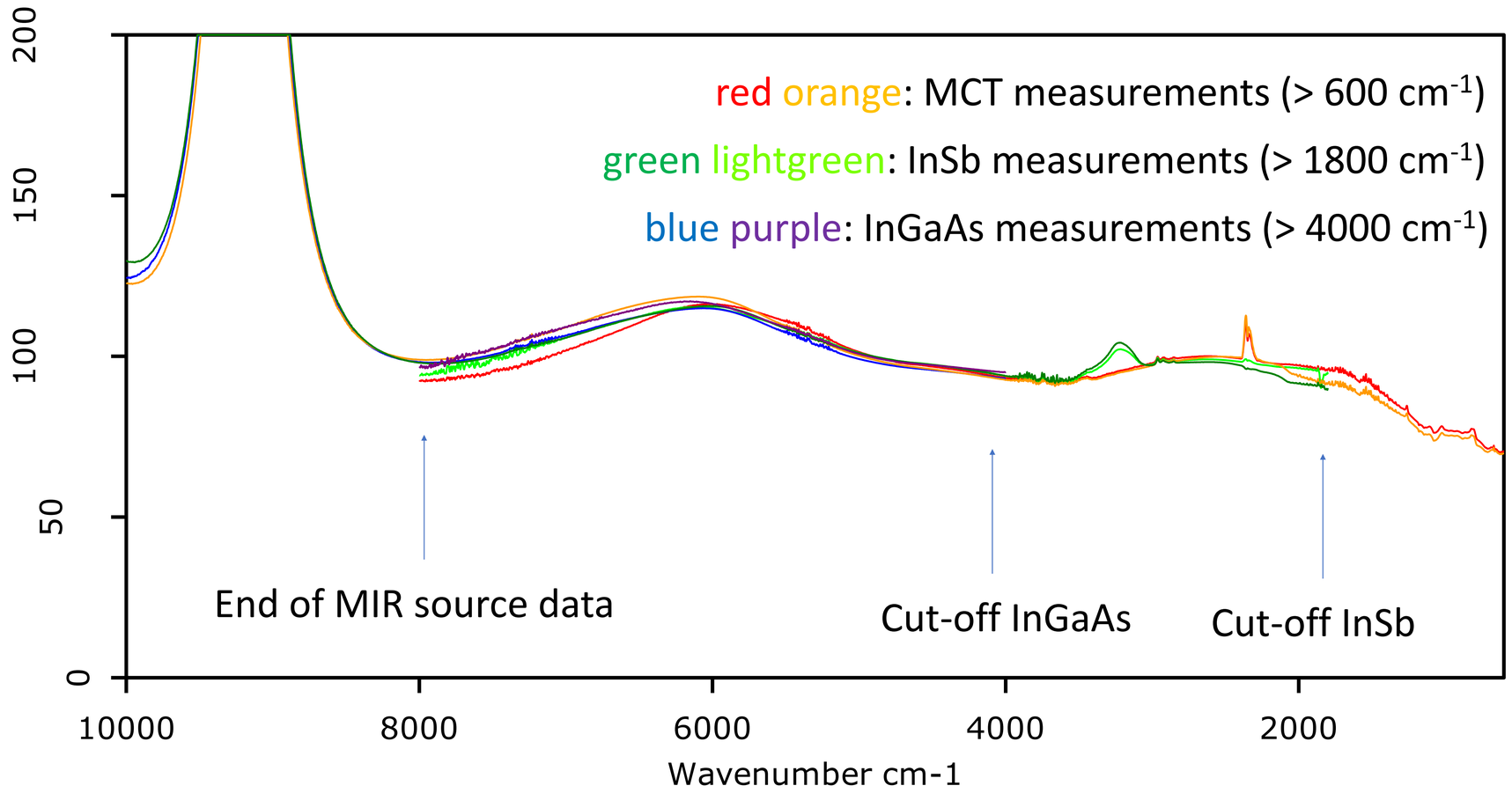
blue: Standard KBr T303/IR
red: KBr extended T304/IR
black: ratio „KBr extended“: „Standard KBr“





V70v, InGaAs detector, 0.5mm aperture, **MIR source**

T303/IR standard KBr vs T304/IR wide range KBr



Tremendous throughput gain for T304/IR > 8000 cm^{-1}
Significant throughput gain for T304/IR ~ 6000 cm^{-1}
Worse performance than standard KBr < 2000 cm^{-1}

Beamsplitter - News

- New part defined:

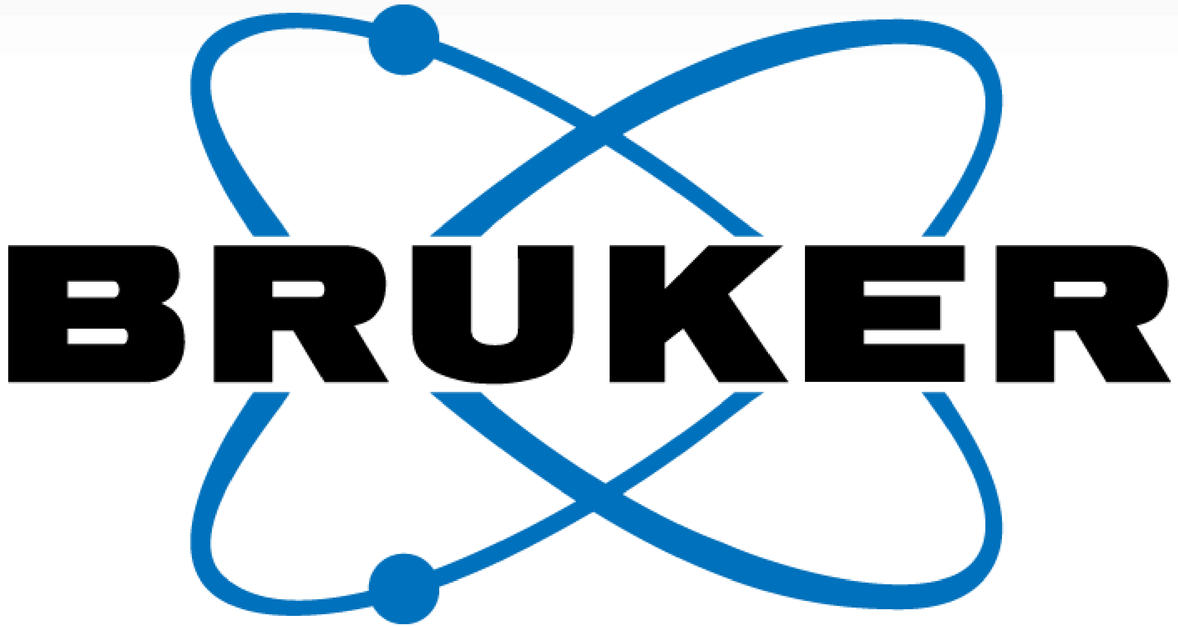
1881248
BB-BEAMSPLITTER KBR 10000-600CM-1
Broadband (KBr) beamsplitter #T304/2"
Spectral range: approx. 10,000-600cm-1
For IFS125HR spectrometer

- At least 3 (or 5) orders, otherwise price unreasonable high
- initial orders placed, delivery in 2021, performance feedback appreciated

Expected from V70v studies:

- Related interferometer design, beam angle

Info for IFS125HR: beamsplitter is 1.9x thicker
→ performance loss in low-wavenumber region < 2000 cm-
Reduced spectral range… app: 10,000-600 cm-1



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