

Experimental

Preparation

- Maintain stable room temperature
- Fill InSb detector with liquid nitrogen.
- Turn on globar source
- Stabilize detector and source for 1 h.

Configure instrument settings

Scan background signal without HBr cell.

Scan signal with HBr cell

Save raw interferograms and spectra.

LINEFIT

Pre-process HBr Spectra

- Load both spectra into OPUS
- Compute the HBr transmission spectrum
- Trim HBr spectrum to isolate rovibrational lines

- Hold the ILS at default value
- Retrieve HBr cell parameters including cell temperature, pressure and column amount

Start

Configure Nominal Parameters

- Input processed HBr spectrum
- Import HITRAN database
- Select HBr P-branch lines (2408–2530 cm^{-1})
- Default instrument parameters

Fit HBr Cell Parameters

Non-ideal Instrument assumption ?

Fit auxiliary parameters

Fit ILS Parameters

- Nominal values of auxiliary parameters: offset=0.0, scale=1.0, channeling amplitudes=0.0 and shift=0.0, ME=1.0, PE=0.0
- fitting is required due to deviation from these nominal values

No/Minimal auxiliary parameters

No Fit of ILS Parameters

LINEFIT ILS

ALIGN60

Start

Input Configuration

Initial Constant Shear Fitted ?

- OPDmax = 100 cm
- $\nu_0 = 2400 \text{ cm}^{-1}$
- FOV radius = 1.93 mrad
- Beam diameter = 8.5 cm
- Boxcar, ILS grid step, gridpoints
- Other parameters = default

- Start with reference value
- Tune until ALIGN60 and LINEFIT ILS agree (min RMS)

- Adjust linear shear
- Adjust periodic shear components
- Iterate until convergence (min RMS)

Linear & Periodic Shear Adjustment Fitted ?

Validate Performance
If RMS < 0.1, convergence is reached

• Haidinger fringes
• Align60 ILS