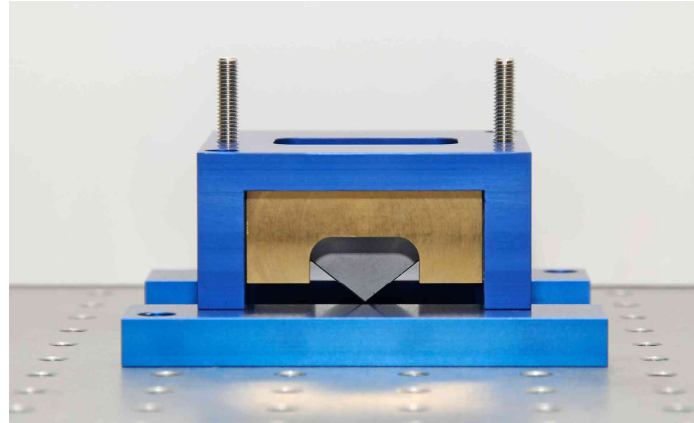


Data sheet SHA

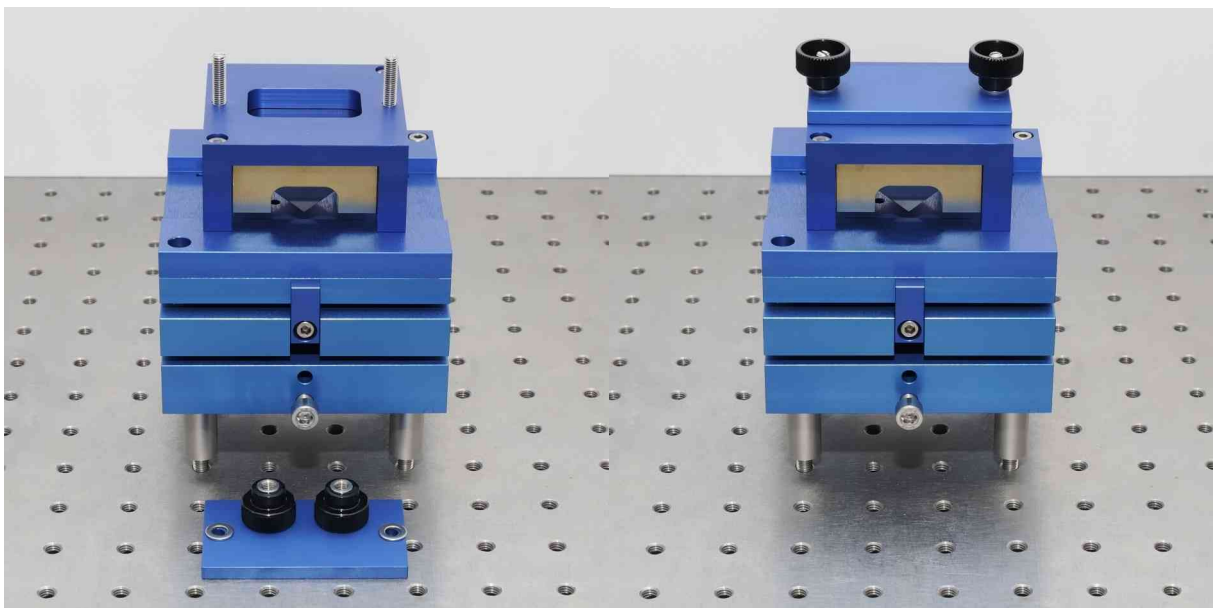
Sample Holder for ATR measurements

ATR – Attenuated Total Reflection



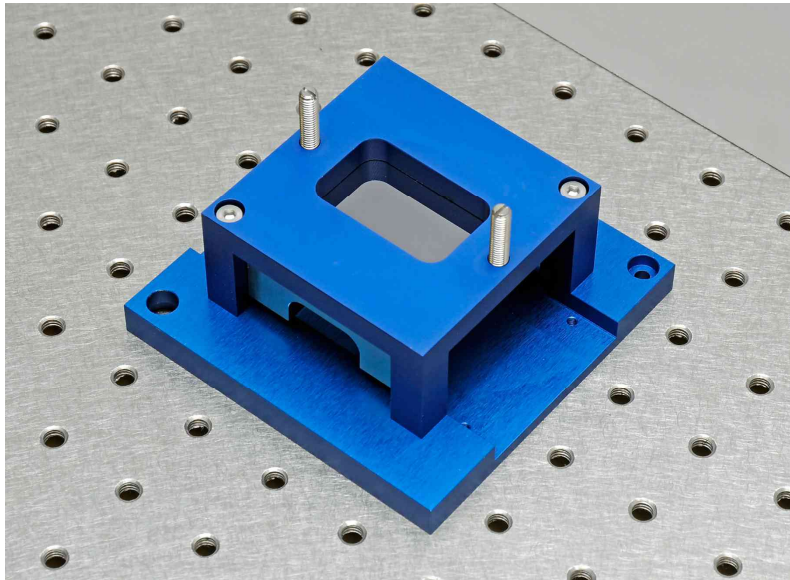
Side view of SHA without lid

The sample holder for Attenuated Total Reflection (ATR) measurements requires the base structure that comes with the transmission setup and every TDS system. It is meant for fluids or solids with a high absorption coefficient and a refractive index lower than 2.5. The THz beam is directed by the silicon ATR prism towards its top surface where attenuated total reflection occurs. The THz signal will be altered by the properties of the sample on top surface. The penetration depth of the evanescent wave is proportional to the THz wavelength.



Sample holder for ATR measurements, with and without lid, mounted on base structure

The SHA shall be mounted on base structure that comes with the sample holder transmission (SHT) and every TDS system. The base structure allows a fine adjustment of ATR prism so that the THz beam hits the detector antenna.



Top view of SHA without lid

Parameters

Refractive index of silicon prism:	$n_{\text{Si}} = 3.416$
Free area for sample placement	25 mm (width) x 40 mm (length)
Sample refractive index	$n_{\text{Sample}} < 2.5$
Incidence angle of THz beam	$\alpha = 51.6 \text{ deg}$

Important remarks

When working with volatile fluids it is required to close the ATR sample holder using the lid provided in order to reduce fumes to a minimum. It has to be noted that these fumes could be ignited by the short pulse laser used to drive the THz antennas, especially for systems without an enclosure of the laser beam path. Therefore, the customer is required to handle the fluid according to its safety data sheet.

Because of the high refractive index of the silicon there is a significant time shift of the THz pulse compared to the transmission setup. The THz peak is found about 350 ps later. In case you build your own THz spectrometer we recommend setting the THz pulse for transmission at a time delay of about 150 ps. When using a 100 mm delay line you'll have enough room to work with the SHA.

Contact

If you have any further questions or remarks, please do not hesitate to contact us.

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