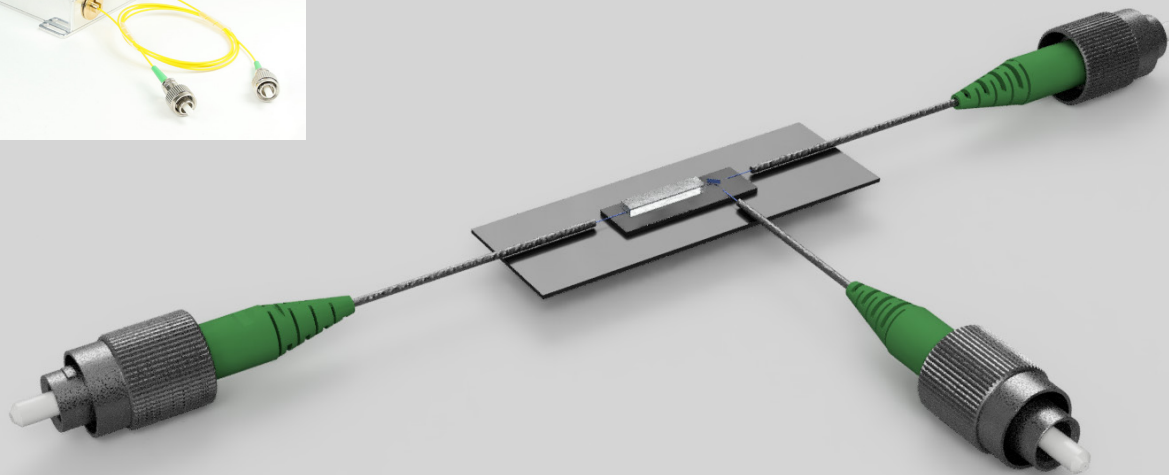


Photon Pair Source



μBench with integrated ppKTP crystal for quantum technology

AT A GLANCE

HHI's μBench based on the hybrid integration platform PolyBoard enables the integration of micro-optical functions and elements on photonics integrated circuits (PICs).



Features

Polymer-based photonic integration platform featuring:

- **U grooves:**
F/C coupling, GRIN Lenses, free space sections for crystals
- **Slots:**
Thin film elements as $\lambda/2$ plate, $\lambda/4$ plate, polarization beam splitter (PBS), filters
- **45° mirrors:**
PD / VCSEL coupling

Applications

- Telecom / datacom
- Quantum technology
- Microwave photonics
- Sensing and analytics
- Medical and life science

Micro-Optical Bench (μBench)

HHI's μBench demonstrates the capability and flexibility of hybrid photonic integration.

Features as slots, U-grooves or vertical mirrors allows a hybrid integration of passive or active elements.

Typical passive elements to be integrated:

SM fibers, GRIN lenses, crystals, $\lambda/2$ plates, $\lambda/4$ plates, PBS, thin film filters

Typical active elements to be integrated:

lasers, photo diodes, modulators

References

International R&D projects

PHOENICS
 POETICS
 POLYNICES
 QSNP
 Qu-Test / Qu-Pilot
 SPRINTER

TERA 6G
 TERAMEASURE
 TERAWAY
 (funded by EU commission)

National R&D projects

PolyChrome Berlin
 PoLiSiQ
 QuNET
 Silhouette
 VOMBAT
 (funded by BMBF)



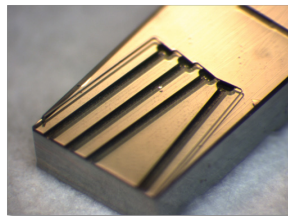
Crispin Zawadzki
 Hybrid Integration and Sensing

Phone +49 30 31002-624
 crispin.zawadzki@hhi.fraunhofer.de

Fraunhofer Heinrich Hertz Institute
 Einsteinufer 37, 10587 Berlin
 Germany

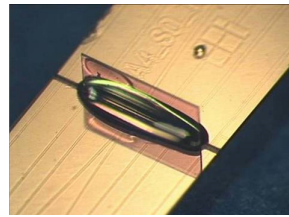
www.hhi.fraunhofer.de/pc

Features



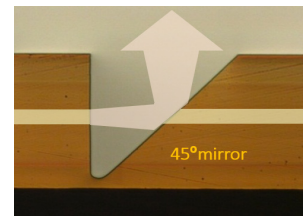
U grooves

- F/C coupling
- GRIN lenses
- Free space sections



Slots

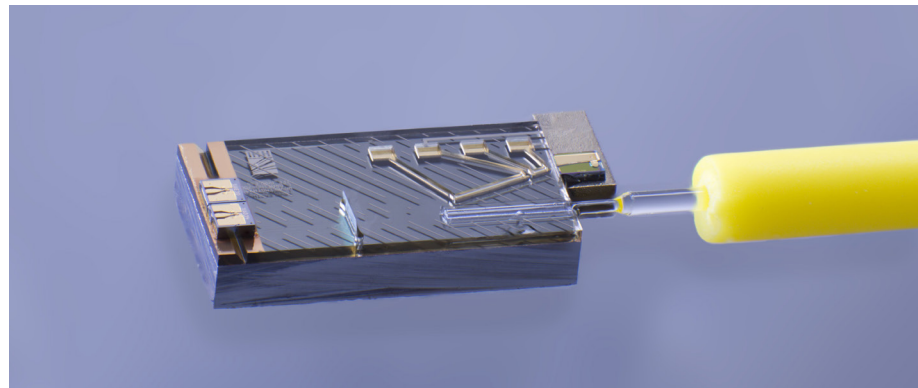
- PBS/PBC
- $\lambda/2$ & $\lambda/4$ plates
- Filter



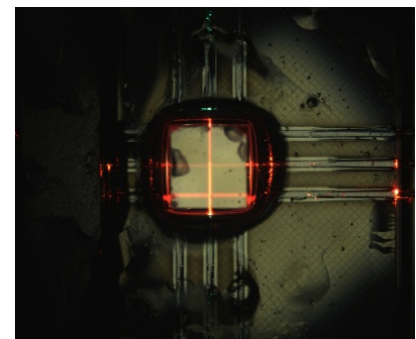
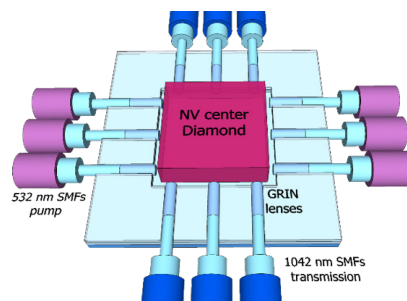
45 mirror

- Vertical input/output
- PD coupling
- VCSEL coupling

Applications



Telecom/Datcom: FFTH transceiver based on HHI's optical μ Bench



Quantum Sensing: Magnetic field measurements w/ NV centre diamonds