



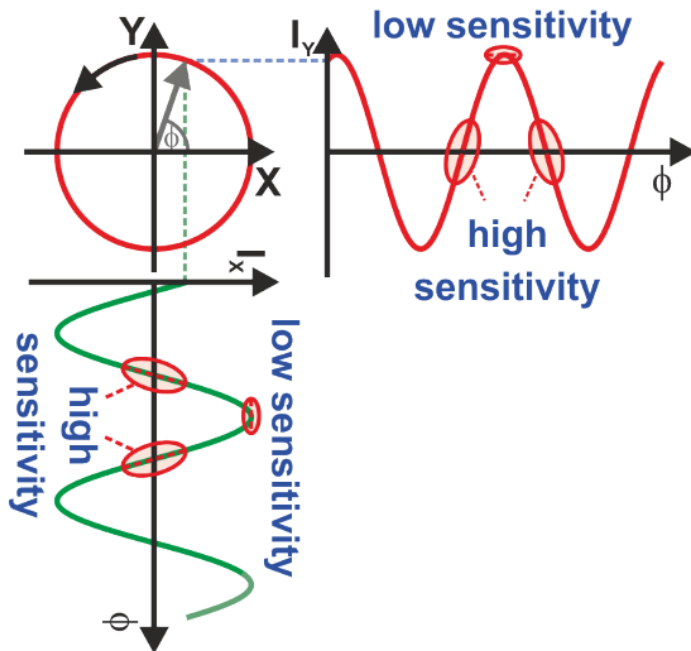
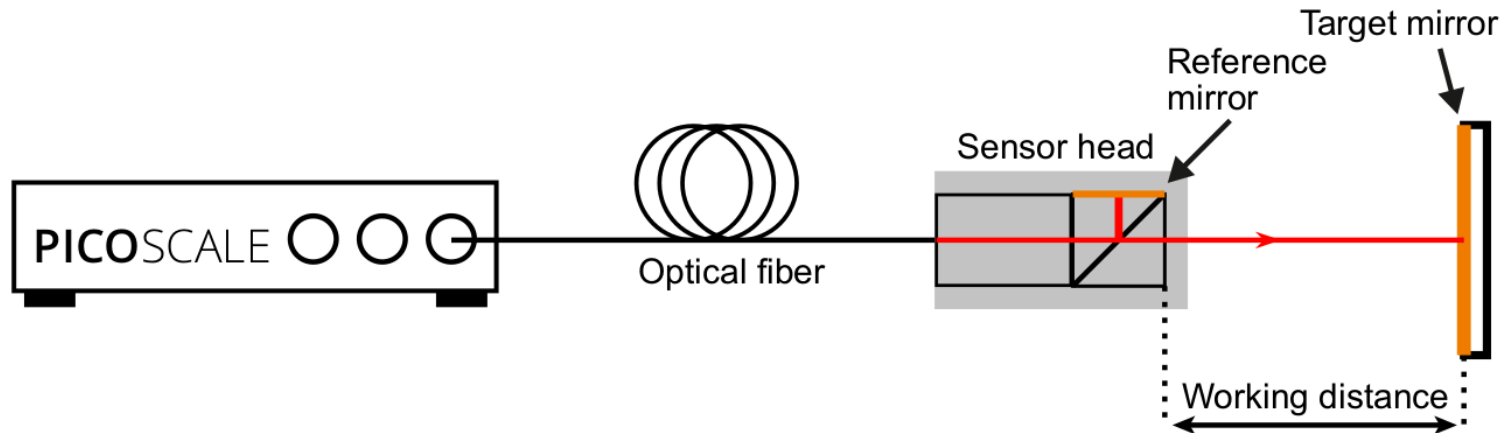
# PicoScale Interferometer

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all information from SmarAct GmbH

# PicoScale Accuracy



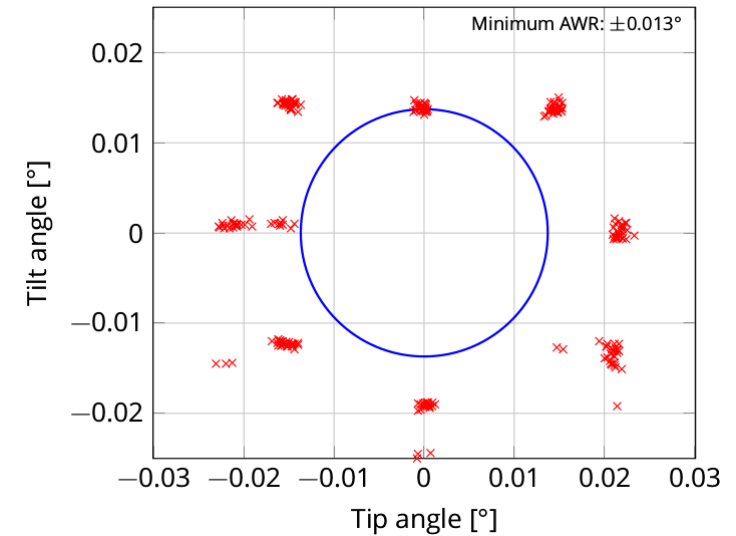
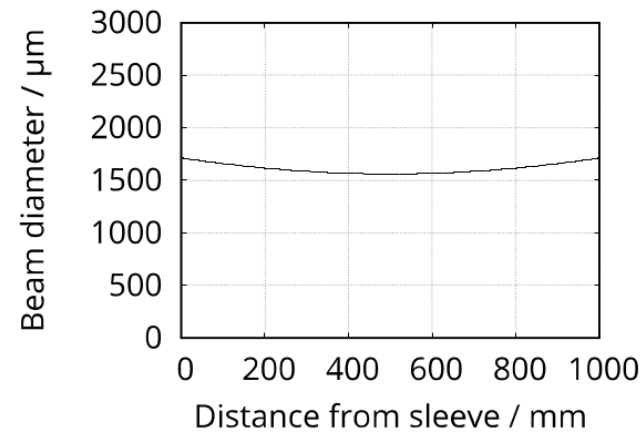
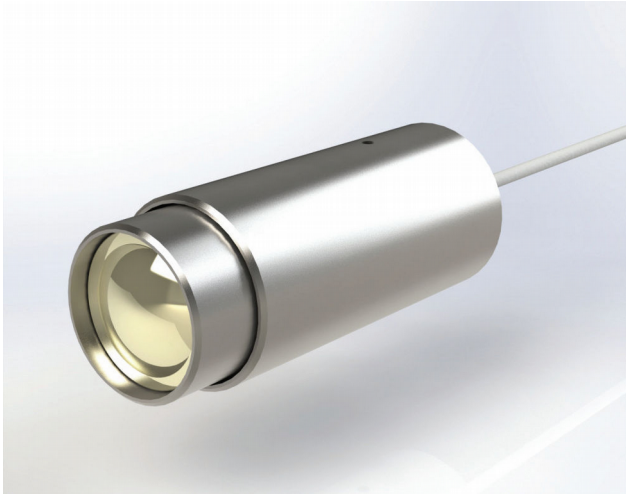
- $\lambda \approx 1550$  nm
- modulated at  $\omega \approx 30$  MHz, i.e.  $\lambda_{\text{mod}} \approx 10$  m
- Demodulation gives  $S(\omega)$ ,  $S(2\omega)$ 
  - quadrature signal
  - up to **pm accuracy**
- **but:** absolute distance accuracy  $\sim 1$  mm

# Sensor Head

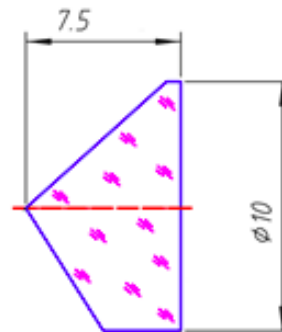
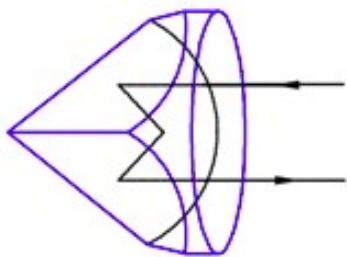
## “Sensor Head C02”

*high working distance*

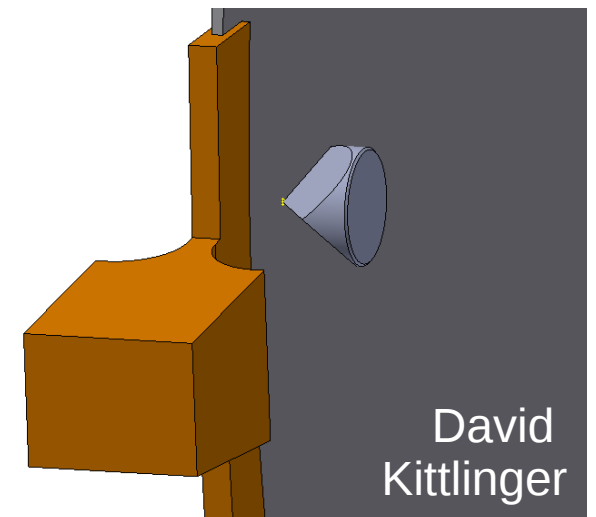
*low angular acceptance*



→ **Retro-reflector needed**



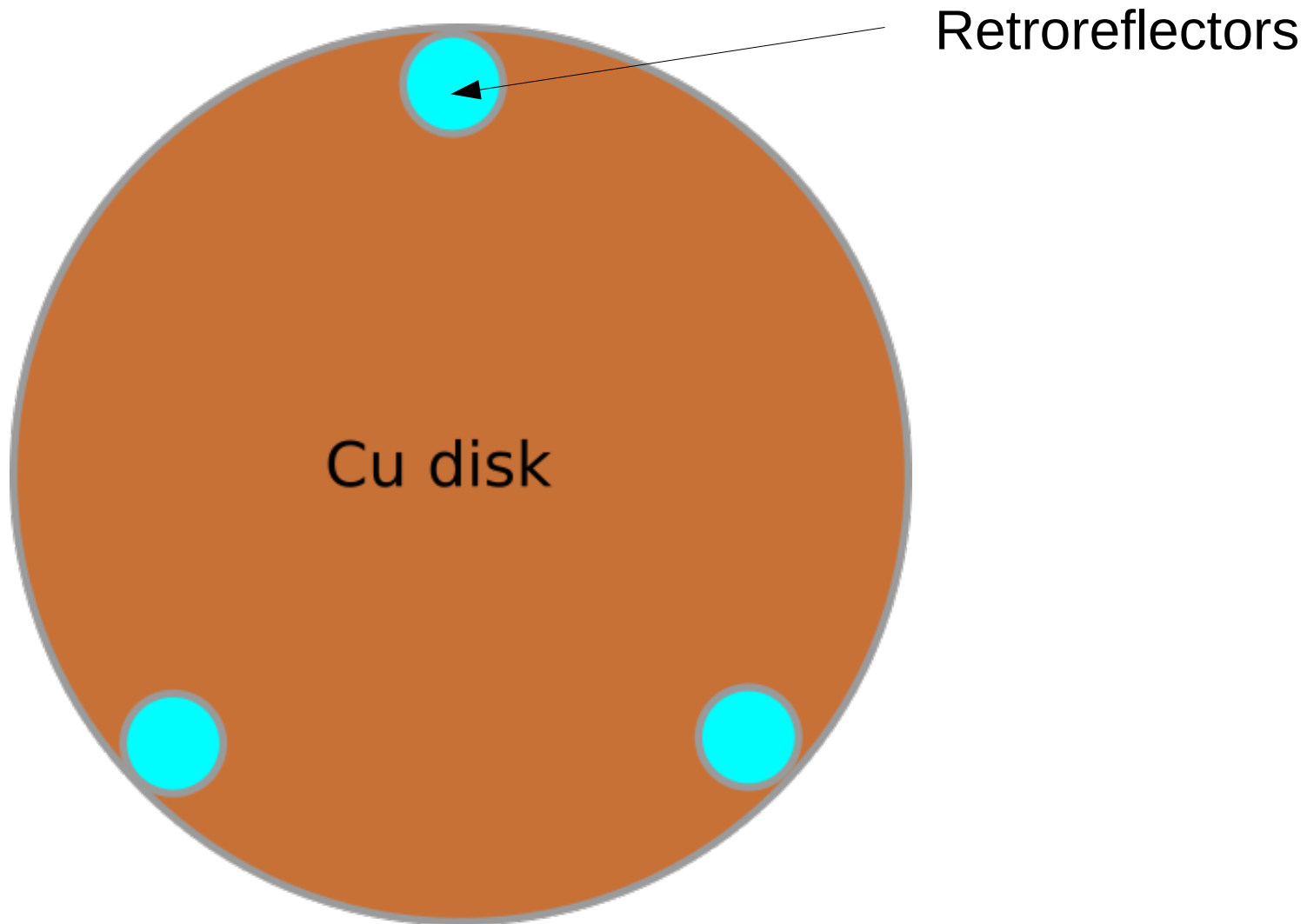
→ **reduced accuracy still better than ~1µm**



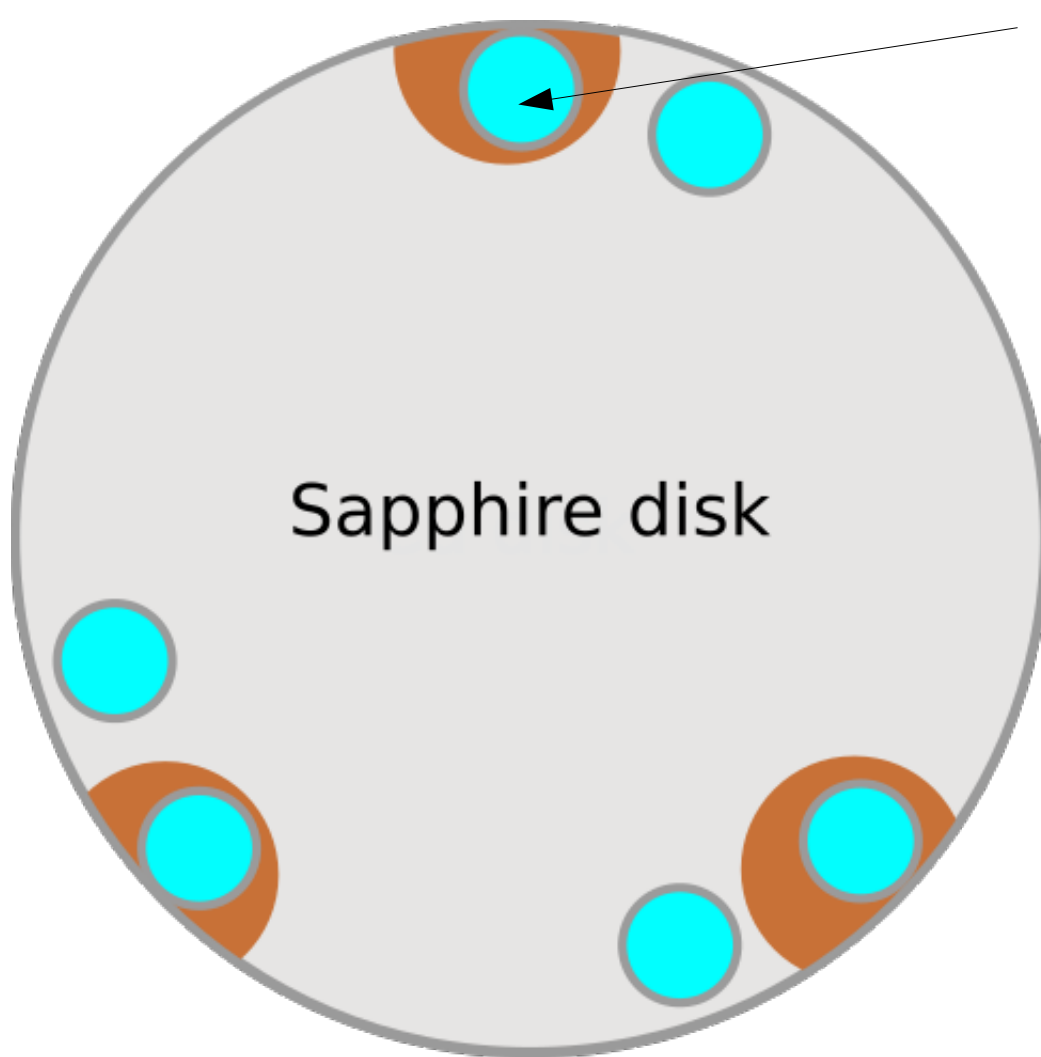
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# Implementation

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# Implementation

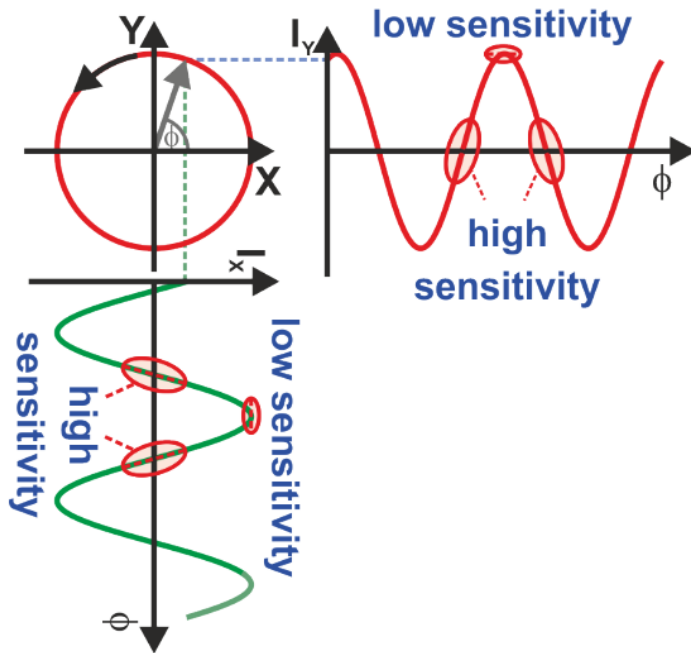


Retroreflectors

need:

- ability to **rotate laser heads** around beam axis
- without displacement in beam direction  
 **$\Delta z \sim \text{few } \mu\text{m}$**

# Conclusion



## Attractive Features:

- high accuracy even at large distance
- 3 channels → measure tilt
- automatic feedback system

## Main Drawback:

- Absolute distance measurement not accurate enough

