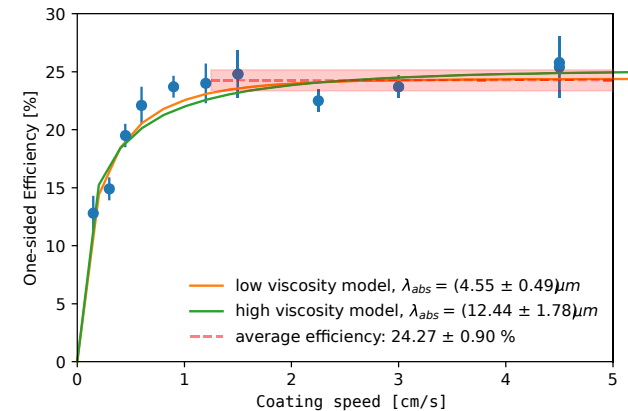
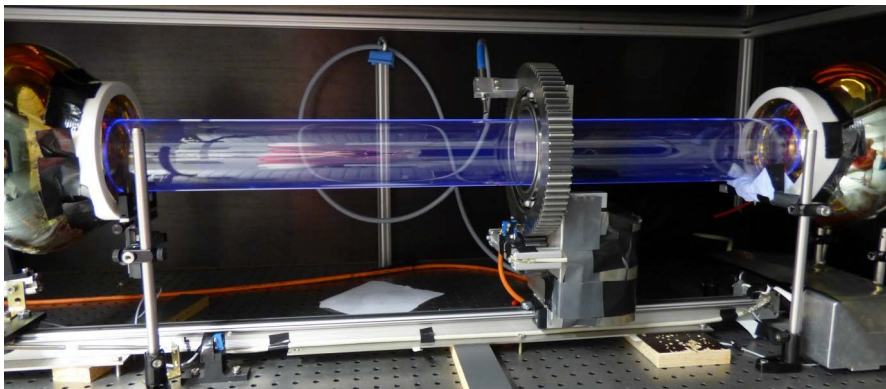
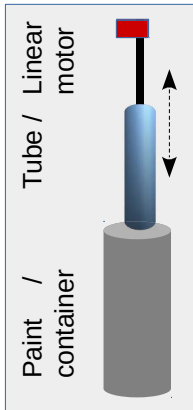
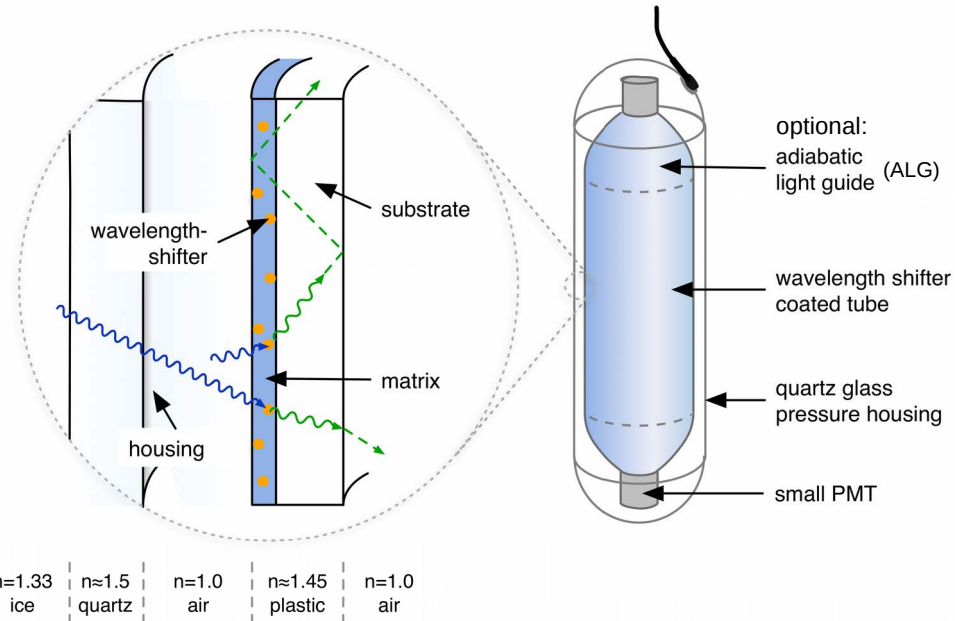


The Wavelength-shifting Optical Module (WOM)

- Quartz glass cylinder (Ø11 cm, L=113 cm)
- Wavelength-shifter coated quartz-tube inside
- UV is absorbed and re-emitted as optical light
- Light trapped by total internal reflection and detected by small, low-noise PMTs

Advantages:

- Large effective area, low noise
- x10 increase in SNR or more
- Cost effective



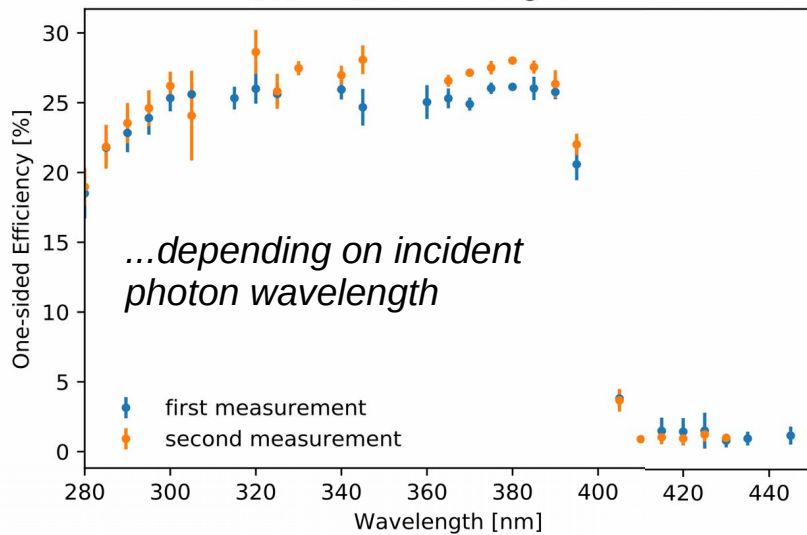
WLS tubes produced by dip-coating...

...and characterized in z- Φ - λ -test setup with calibrated PMTs

Efficiency depends on coating speed
Homogeneity better than $\pm 5\%$

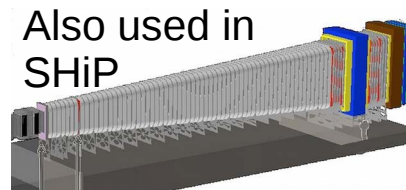
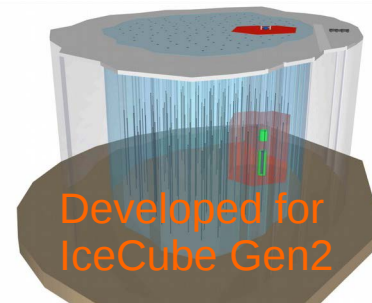
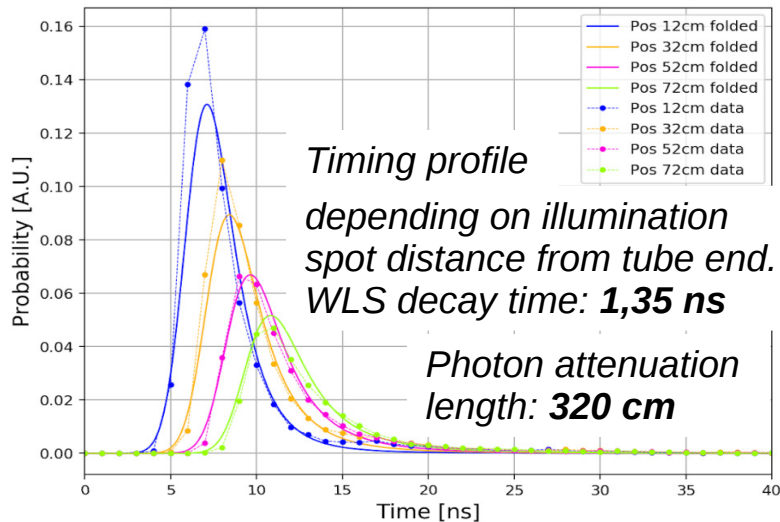
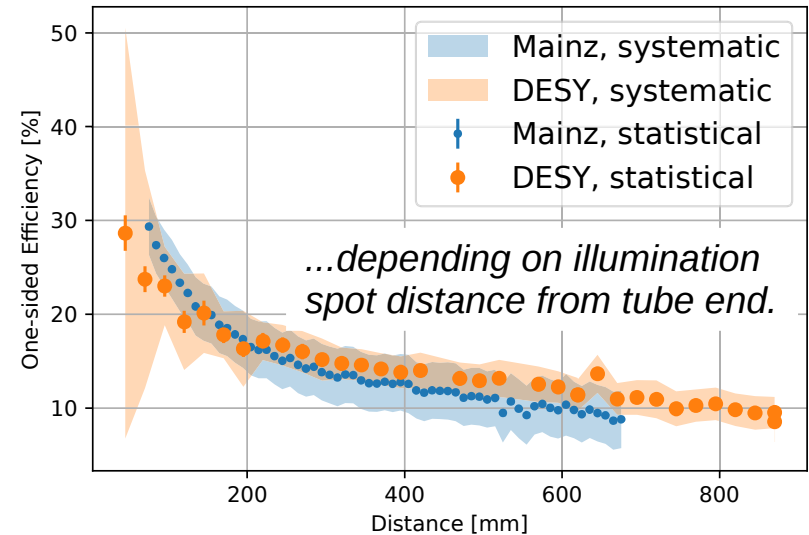
Performance of the WOM

Quartz tube: Gomez @ 150mm



One-side efficiency...

Tube: Garry @ 375nm



Summary:

- Prototype built
- Full absorption of incident UV-light
- 43% efficiency for 90 cm long tube
- SNR gain > factor 10 vs. PMT (without ALG)
- even higher with ALG
- Ideal for Cherenkov-detectors