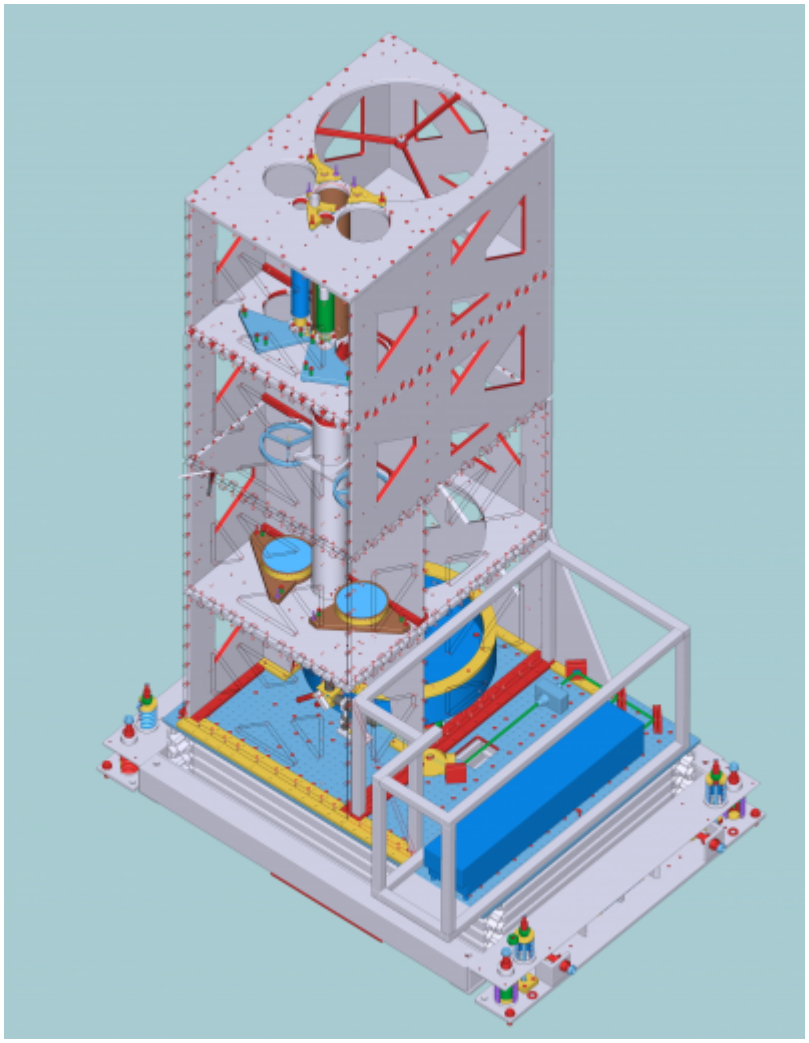
LICHT lidar

Raman lidar system LICHT (LIdar for Cloud, Humidity and Temperature profiling) has been designed and built in 2013 to expand the observation capability of MPI-M and in particular to be replacement system for EARLI lidar deployed at that moment at BCO station. LICHT lidar having similar measurement characteristics to EARLI was already designed for high isolation from outdoor environment. Besides better protection against harsh environment the LICHT lidar has got capability of daytime water vapor measurements. Operation range has been extended from 15 km for EARLI to 29 km for LICHT (implemented on June 14, 2017). In addition, it has been equipped with automated window washing installation (built in and activated on July 7, 2017) that allowed significant improvement of data quality thanks to reduced transmission losses on output and input windows of lidar container. LICHT lidar system is deployed at BCO station since July 2016. For EUREC4A campaign it is planned to operate LICHT lidar from on-board of German research vessel Meteor.



Technical characteristics

Pulse repetition rate	10 Hz		
Laser pulse energy	@ 355 nm	@ 532 nm	@ 1064 nm
	125 mJ	125 mJ	200 mJ
Laser beam diameter	80 mm		
Laser beam divergence	70 µrad		
Operating range	@ 355 nm	@ 532 nm	@ 1064 nm
	0 - 15 (29) [1] km	0 - 15 (29) [1] km	0 - 15 km
Receiving telescopes:			
telescope ID	**Focal length**	**Diameter**	**Field-of-view**
“Far-range”	2000 mm	500 mm	250 µrad
“Near-range”	450 mm	150 mm	450 µrad
“Close-range”	100 mm	22 mm	2000 µrad
“Depolarization”	500 mm	50 mm	400 µrad

[1] measurement height limit for counted channels has been extended from 15 to 29 km on June 14, 2017

Parameters measured

Product	Wavelength of emission stimulating lidar return
Attenuated backscatter	1064, 532, 355 nm
Particle backscatter	532, 355 nm
Particle extinction	532, 355 nm
Volume linear depolarization ratio	532 nm
Particle linear depolarization ratio	532 nm
Cloud mask	532, 355 nm
Water vapor mixing ratio	355 nm
Air temperature	355 nm
Relative humidity	355 nm

DATA ACCESS

Data collection recommended for scientific use is the calibrated **quicklook** dataset stored under:

```
/opt/pool/OBS/ACPC/RamanLidar-LICHT/3_QuickLook/nc/
```

For the period from June 2016 until July 12, 2017 the exact link for particular year, month, day timestamp of YYMMDD is given with:

```
/opt/pool/OBS/ACPC/RamanLidar-
LICHT/3_QuickLook/nc/qlYYMM/jlYYMMDD0000.b[532|355]
```

Starting from July 12, 2017 the filename pattern has been slightly modified, respectively the data link has also changed reflecting the new filenames:

```
/opt/pool/OBS/ACPC/RamanLidar-
LICHT/3_QuickLook/nc/qlYYMM/liYYMMDD.b[532|355]
```

Data are stored in netcdf format. Files with “532” in file extension combine together every lidar product related to atmospheric lidar response stimulated with the laser emission at 532 nm, respectively the “355” files bundle together the products related to atmospheric response to sounding laser emission at 355 nm.

To check data availability please have a look at the lidar quicklook web page:

http://bcoweb.mpimet.mpg.de/quicklooks/lidarql/RamanLidar-LICHT/

or download pdf plots directly from data server:

```
/opt/pool/OBS/ACPC/RamanLidar-
LICHT/3_QuickLook/pdf/li20YY/liYYMM/jlYYMMDD.pdf        before November
2017
/opt/pool/OBS/ACPC/RamanLidar-
```

```
LICHT/3_QuickLook/pdf/li20YY/liYYMM/liYYMMDD.pdf          since  November
2017
```

Extending LICHT lidar data with temperature, relative humidity and particle extinction is in process.