



GRUAN Site Candidate Dolgoprudny



Operated by Central Aerological Observatory (CAO)

http://cao-ntcr.mipt.ru/all_doc/caosite



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Dolgoprudny in brief



Climate:

Moderate mid-latitude continental climate with pronounced seasonality. Warm summer and moderately cold winter. All-year-round precipitation: more in summer, less in winter. Westerly winds prevail.

Location, topography and environment:

Northern suburb of Moscow, 20 km North of the megacity center.

The landscape is characterized by alternating woodland, industrial buildings, and housing estates. The site is surrounded by areas with small water reservoirs and Moscow-Volga navigation canal. Clay podzolic soil prevails.

Topography:

Flat land with level hills

Some wiki facts:

The ~70000 population town is in close connection to upper-air: it is started to develop as an airship manufacturing plant was built there in 1931, where Umberto Nobile worked several years. Lot of CAO scientists have graduated from located one block north to CAO world-known Moscow Institute of Physics and Technology established by inspiration of the Nobel Prize winners Pyotr Kapitsa, Lev Landau, and Nikolay Semyonov.



Dolgoprudny

Upper-air observations



Started 07.07.1940, current program is 00+12 UTC

WMO Id: 27612, MOSKVA (DOLGOPRUDNYJ)

GTS: FM35 and native BUFR (from MARL-A radar - high resolution)

Secondary radars: older 1782 MHz AVK with dish antenna and modern 1680 MHz MARL-A with phased array antenna

Variety of domestic radiosonde types from different manufacturers have no pressure sensor with rather obsolete white painted rod thermistor, new digital MRZ-3MK with bead thermistor

"The best technology currently available at the site" is considered to be MODEM M2K2-DC radiosonde - researches and mobile soundings

Balloons 500g Zhuzhou HWOYEE HY-500, average burst altitude in 2015 21 hPa (best performance – in summer)

MTP-5 boundary layer temperature profiler (1 km)



Dolgoprudny

Upper-air observations – GRUAN strategy



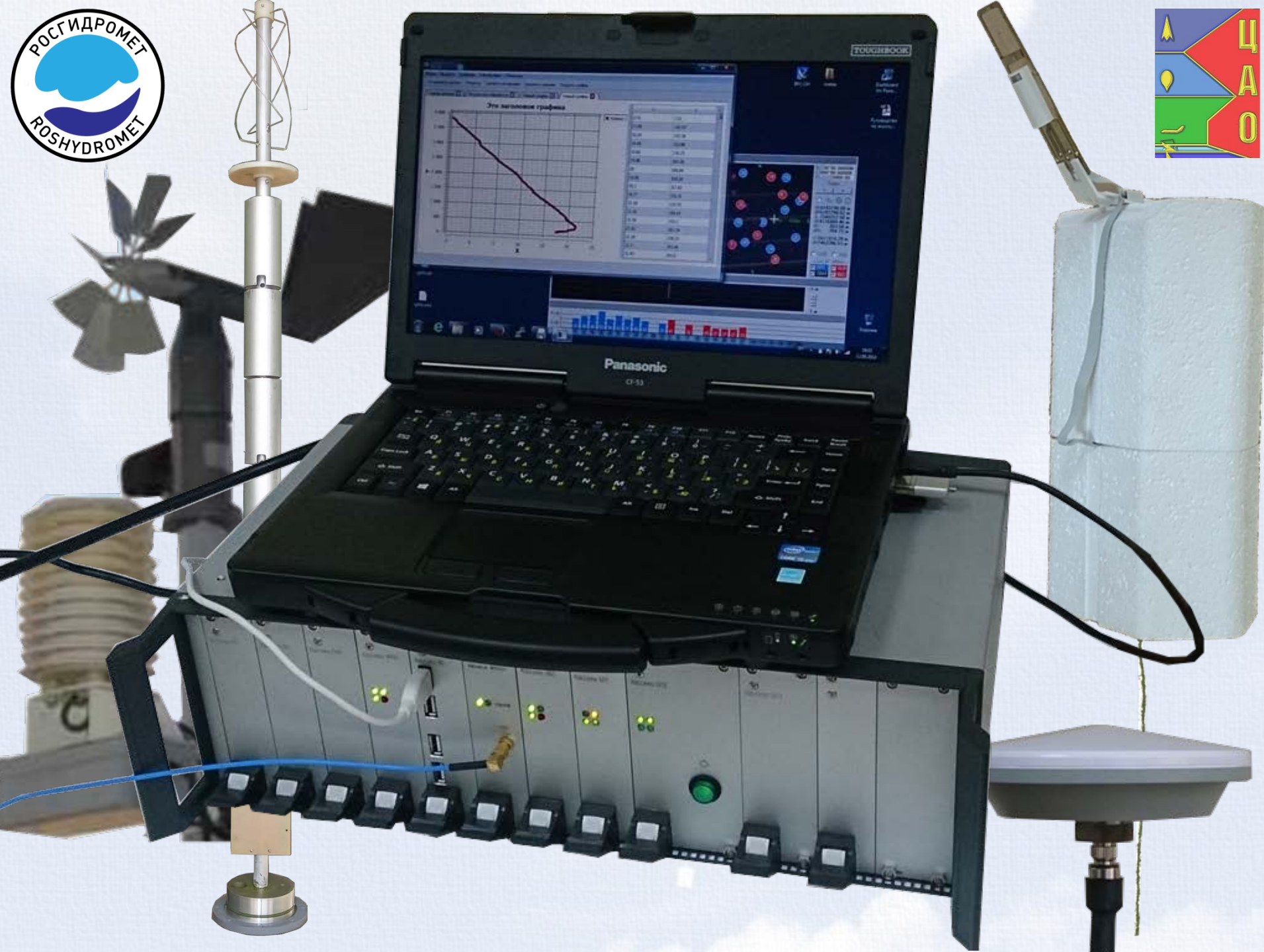
2016 - training routine staff for operation with RSLaunchClient, dual launches MODEM SR10 M2K2-DC

2017 - weekly dual flights MODEM SR10 M2K2-DC with operational radiosondes

After 2017 – transition to MODEM M10

Dolgoprudny - Sounding systems







Dolgoprudny - IWVC



In operation – since 2012
Javad Sigma-G3T GNSS geodetic grade receiver (1 or 10 s sampling rate) equipped with JAV_RINGANT-G3T and automatic weather station (1 min sampling rate), GNSS site identification DOLG. Inventory has been submitted to GFZ



Test operation: "Microradkom", nearly continuous measurements of temperature profiles of the troposphere up to 10 km, total water vapor and liquid content



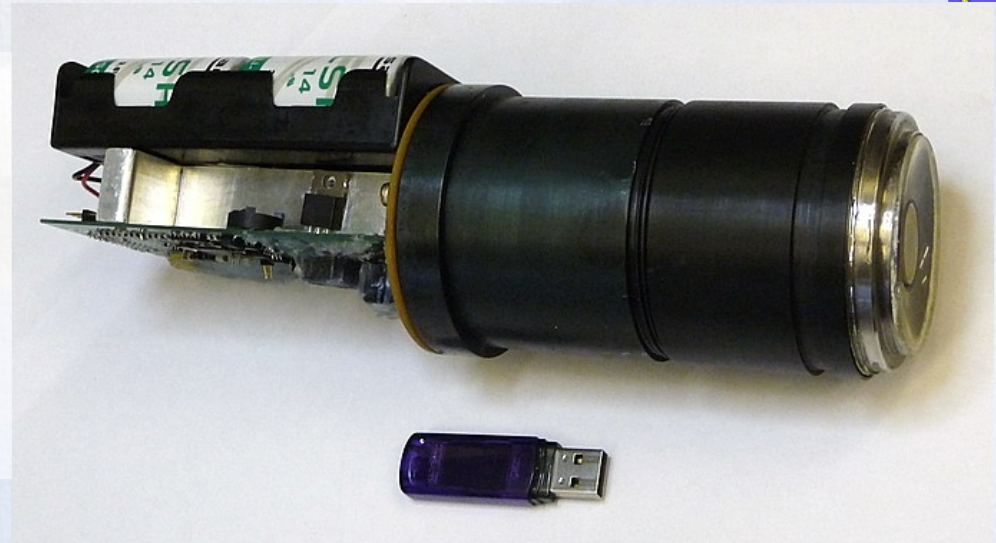
Dolgoprudny - UTLS water vapor



Famous CAO design FLASH-B on its thorny path to GRUAN

External financing – grants, campaigns etc. Great LC assistance

By this moment the only support CAO was able to provide – only calibration and test facilities

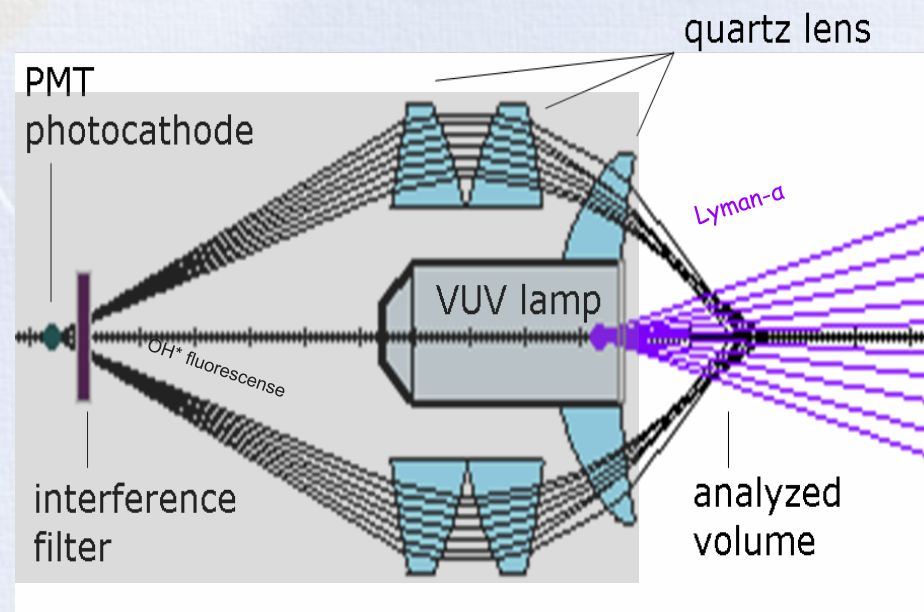
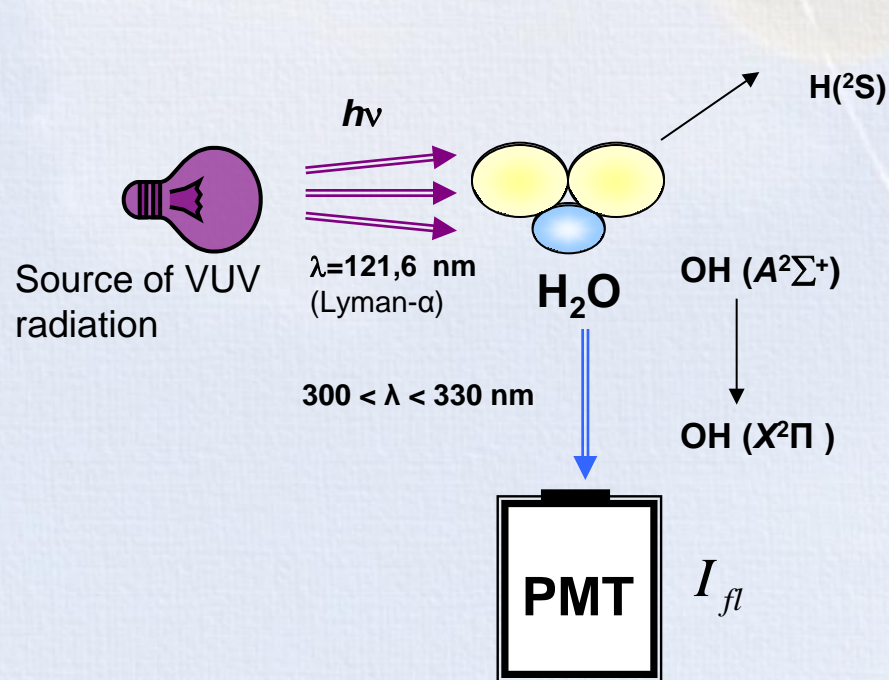


Range of measurement	<i>0.5...1000 ppmv</i>
Resolution time	<i>1 sec</i>
Integration time	<i>4 sec</i>
Precision	<i>5.5%</i>
Total uncertainty	<i><10 % (1σ) at $\mu > 3 \text{ ppmv}$</i>
Vertical resolution	<i>~ 50 m (descent in UTLS)</i>
Temperature range	<i>-95°C ... +40°C</i>
Pressure range	<i>300... 5 hPa</i>
Recalibration before flight	<i>No</i>

Required power	<i>9-30V, 1 W max</i>
Weight (w/o batteries)	<i>500 gr</i>
Size Insulation Box	<i>265 mm x 155 mm x 105 mm</i>
Flight weight	<i>1000 gr</i>
Interface to	<i>Vaisala RS92, RS41 Meisei RS-06G, Meteolabor SRS34</i>
Protocol XData	<i>20 byte/sec</i>

FLASH-B: Fluorescent Advanced Stratospheric Hygrometer for Balloon

The measurement method is based on Lyman-alpha fluorescence technique.
The source of L-alpha radiation is a hydrogen discharge lamp while the detector of OH fluorescence is a PMT running in photon counting mode.



Optical layout of the fluorescent hygrometer (FLASH) for balloon

The instrument uses the open layout, where the optics is looking directly into the outside air. Therefore, measuring only at night. Some progress towards twilight operation is expected



Dolgoprudny - ozone



Routine: WOUDC Station ID 116 MSC ,
M-124 filter instrument

Dobson, Brewer, SAOZ-mini

Great experience in operating ECC
ozonesondes in Siberia

<ftp://ftp.cpc.ncep.noaa.gov/ndacc/station/salekhar/ames/o3sonde>, but not in CAO –
similar to FLASH-B





Some others including
airborne laboratory Yak-42D “Roshydromet”



No details here or – too many...