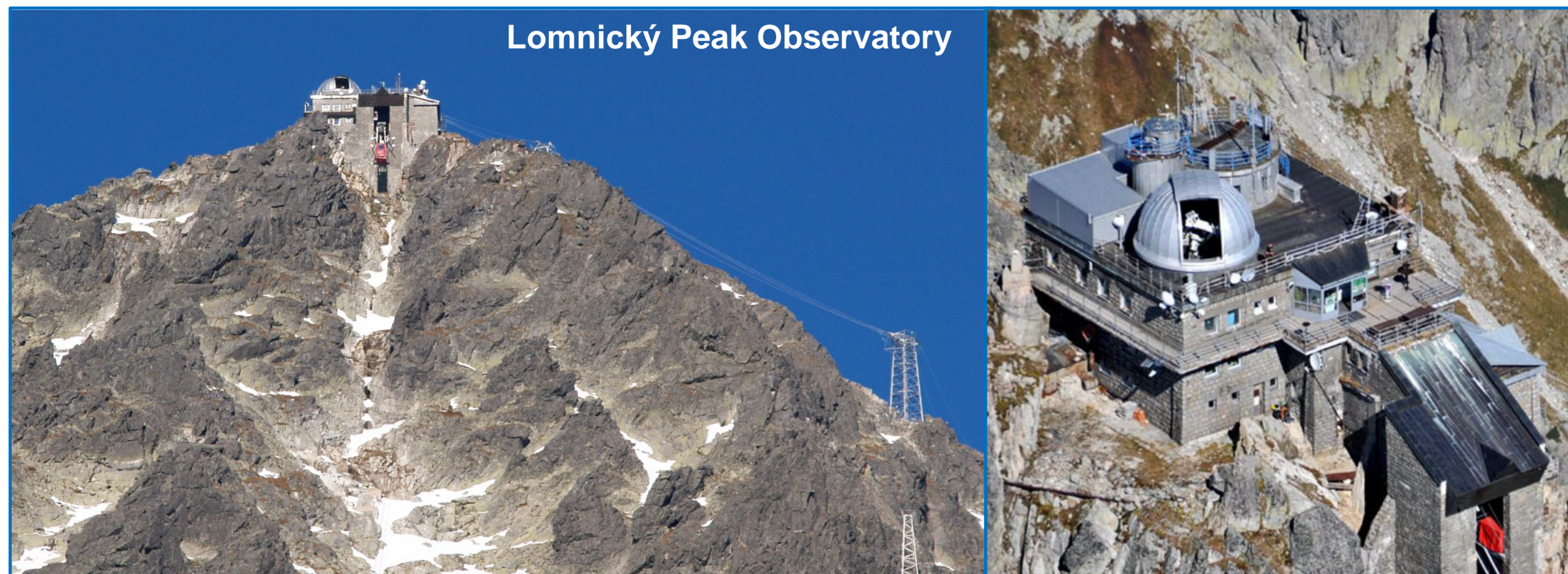


The CoMP-S instrument at the Lomnický Peak Observatory status report (and new SCD instrument)

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The Coronal Multi-channel Polarimeter for Slovakia (CoMP-S) has been installed at Lomnický Peak Observatory of the Astronomical Institute of SAS in 2011. The instrument was designed and manufactured by HAO/NCAR (Boulder, USA) with a tunable Lyot filter and polarimeter for visible and near IR spectral regions. This instrument is proposed for coronagraphic observations of magnetic and velocity fields in the solar corona and in prominences. A fundamental upgrade of this instrument has been done with pair of cameras sensitive in the near IR spectral region. This upgrade is being incorporated to the instrument in course of the year 2014. In this contribution the technical parameters of the final configuration the CoMP-S instrument containing four cameras, covering both visible and near IR spectral regions, are described. We also present a potential of the CoMP-S instrument for coronagraphic spectro-polarimetric observations of the solar corona and prominences with a capability for sequential measurements of the spectral profiles of all prominent emission lines in spectral region from 500 to 1100 nm.



Lomnický Peak Observatory

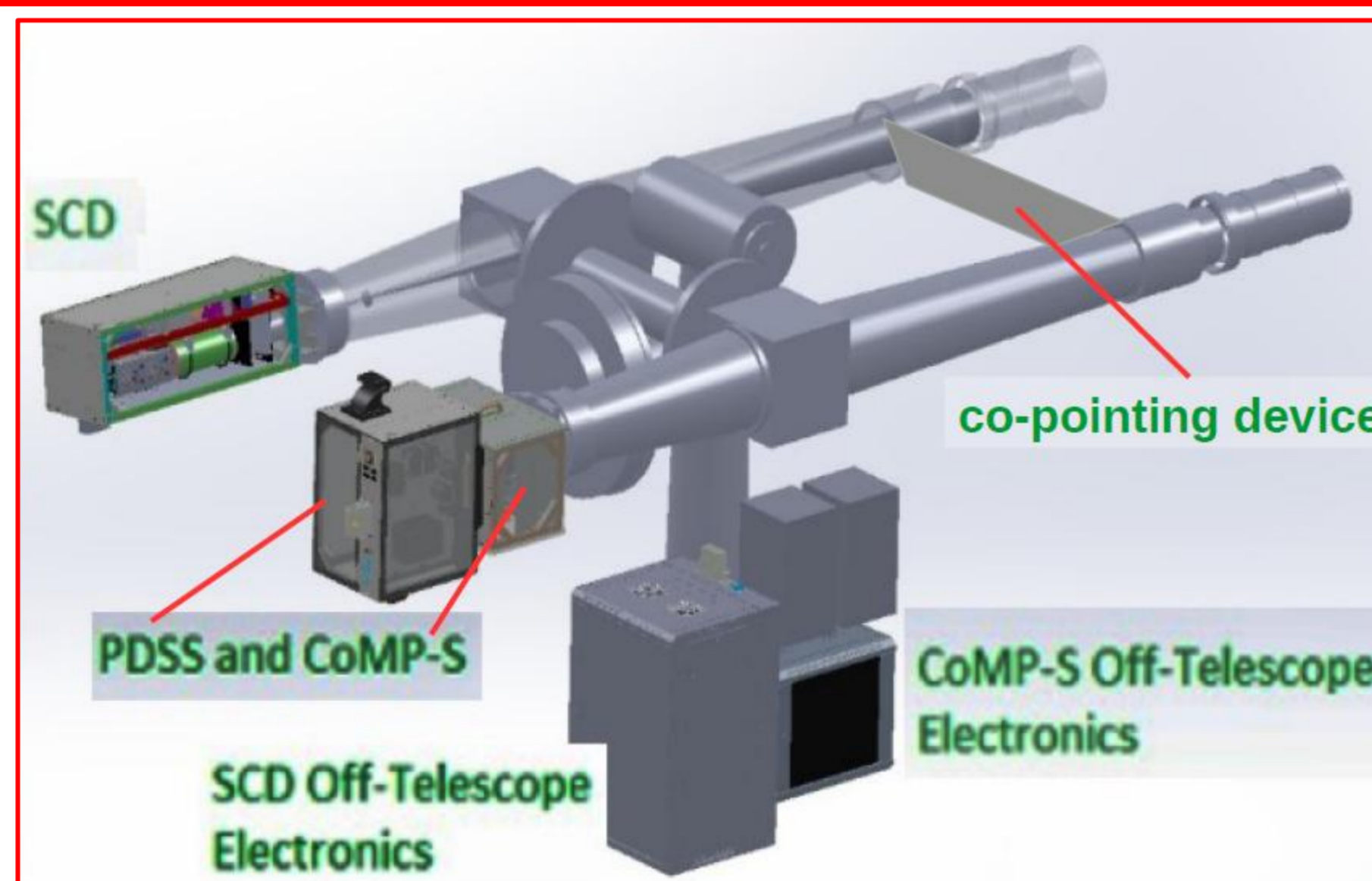
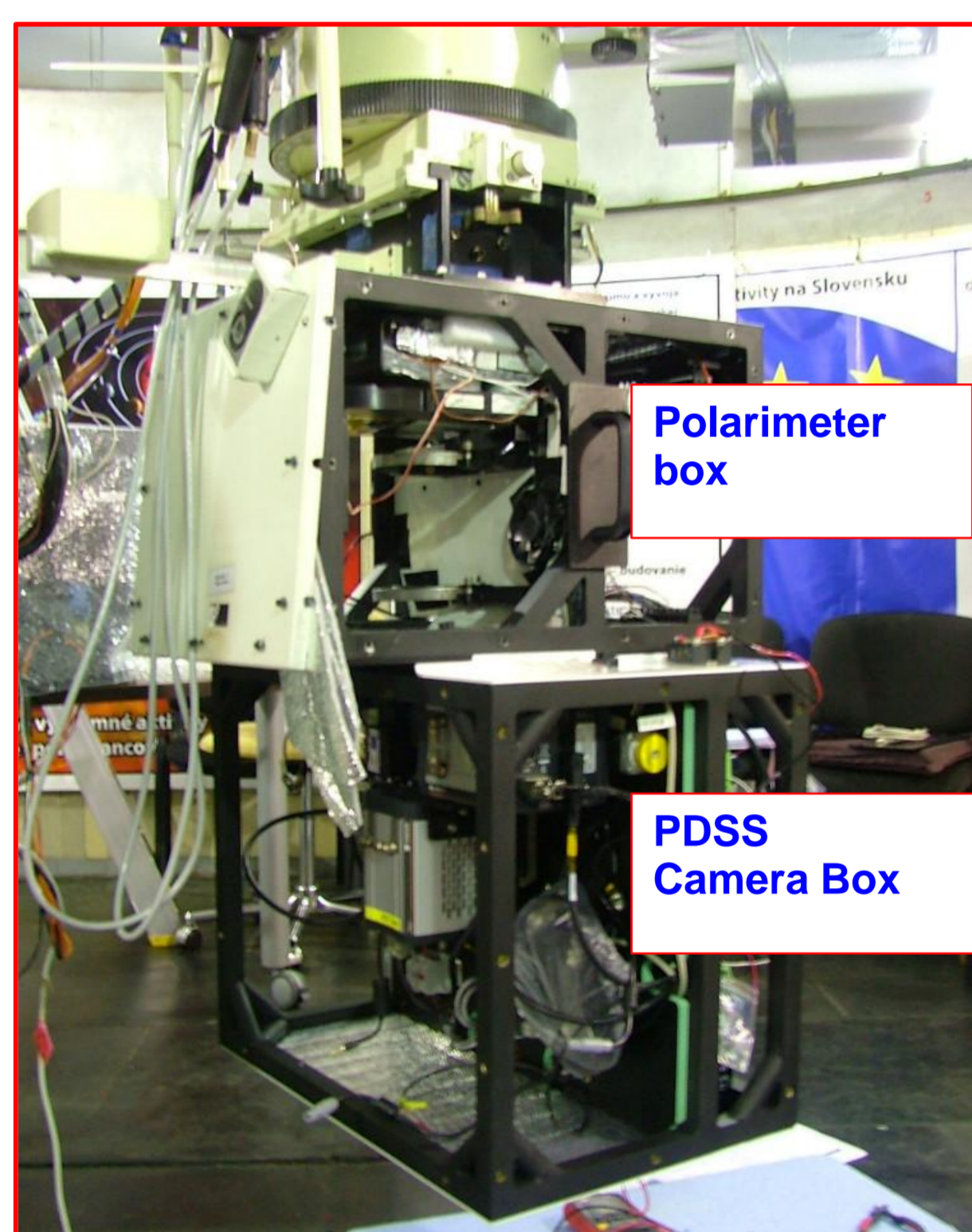
- 2633 m above sea level in High Tatras mountain in the North Slovakia
- One of a few sites still performing routine ground based coronal observations
- Astroclimate: 120 days/year – observations of prominences only
70 days/year – observations of emission corona



Double solar Coronagraph

- two Zeiss 200/3000 coronagraphs installed in 1961 and 1970
- optical twins with co-pointing precision of 2 arcsec
- diameter of the solar image in the focal plane: 4 cm
- field-of-view: 1.02 - 1.84 of the solar radius
- diffraction limited from 530 nm to 1100 nm
- focusing by moving the objective lens along the optical axis ~80mm

Coronal Multi-channel Polarimeter CoMP-S with new PDSS camera modul



Main features

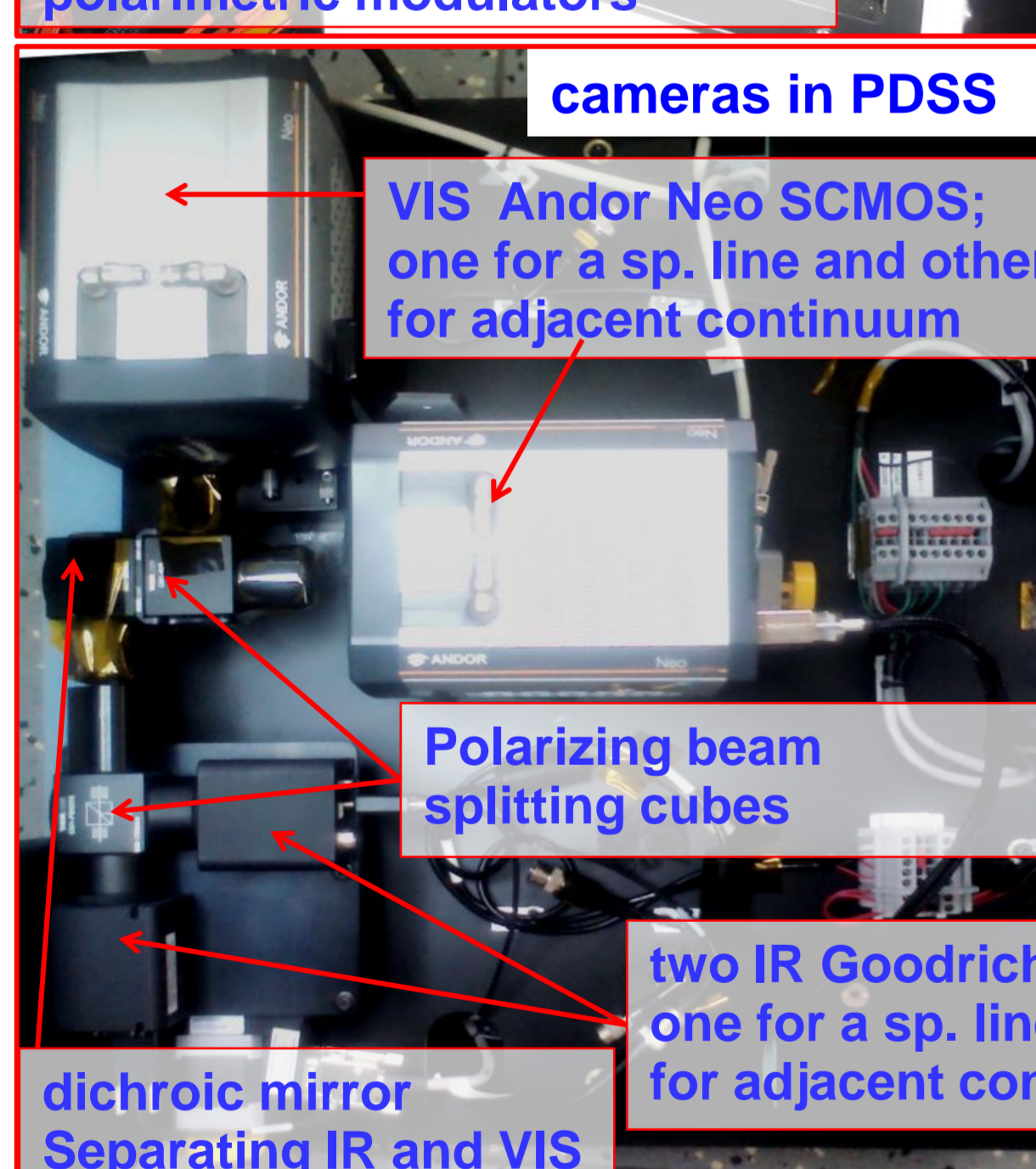
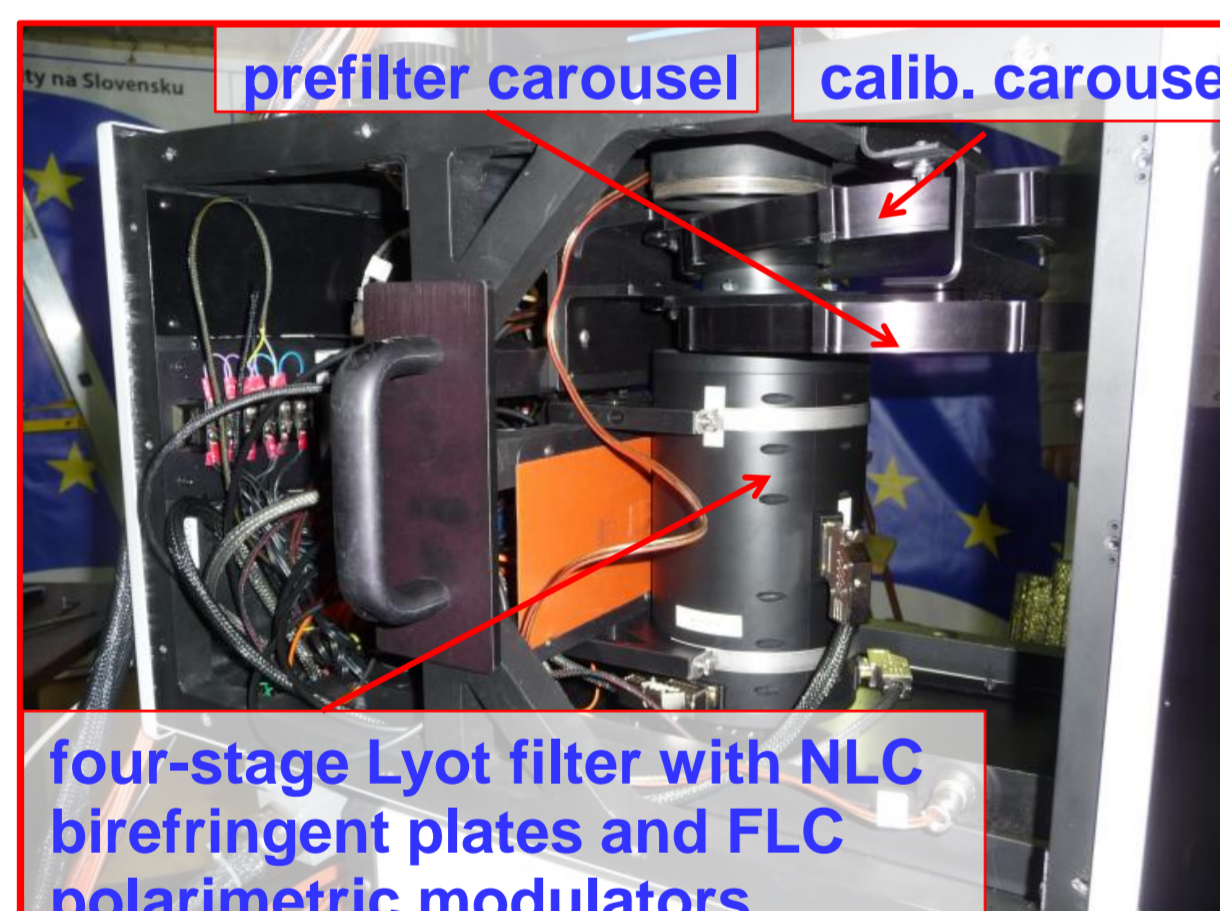
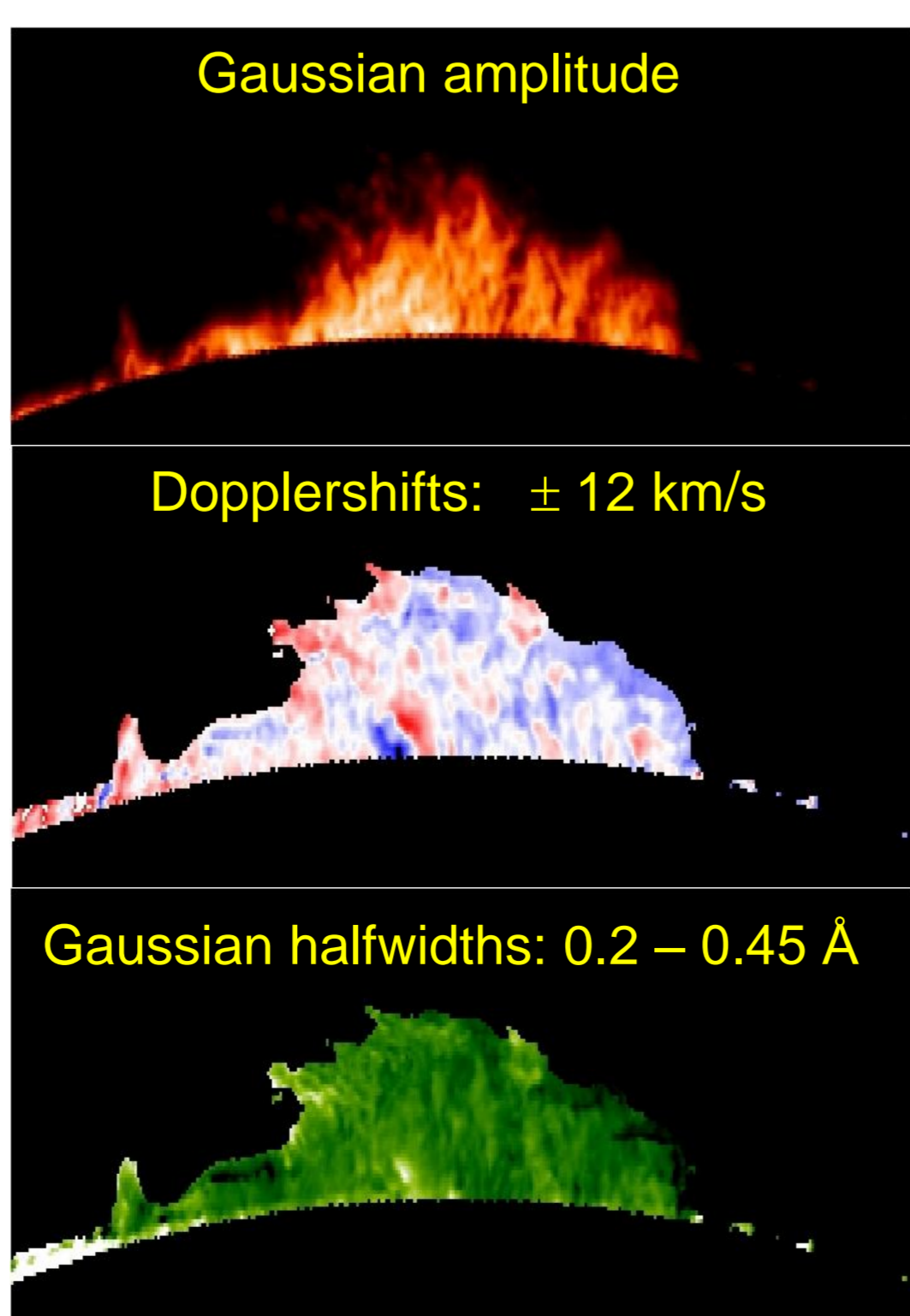
- designated mainly for off-limb observations
- field of view: 14 arcmin × 11 arcmin
- 4-stage tunable Lyot filter with polarimeter (two ferro-liquid crystal polarizers),
- FWHM of transm. fnc 0.28 – 1.3 Å for range 5300 – 10830 Å
- sequential measurement of several VIS and near-IR lines
- deliverables: 2D full Stokes I, Q, U, V
- actual observational output: linear combinations of I ± Q, I ± U, I ± V,
- then, the four Stokes reconstructed from the combinations

Selected emission lines

given by prefilters available in the prefilters

prominences	He I 587.6 nm D ₃
	H α 656.3 nm
	Ca II 854.2 nm
	He I 1083.0 nm
corona	Fe XIV 530.3 nm
	Ca XV 569.5 nm
	Fe X 637.5 nm
	Fe XI 789.2 nm
	Fe XIII 1074.7 nm
	Fe XIII 1079.8 nm

Results of profile Gaussian fitting



An example of CoMP-S observations

Data taken during HOP 186 „Mass loading of quiescent prominences from multi-wavelength observations“

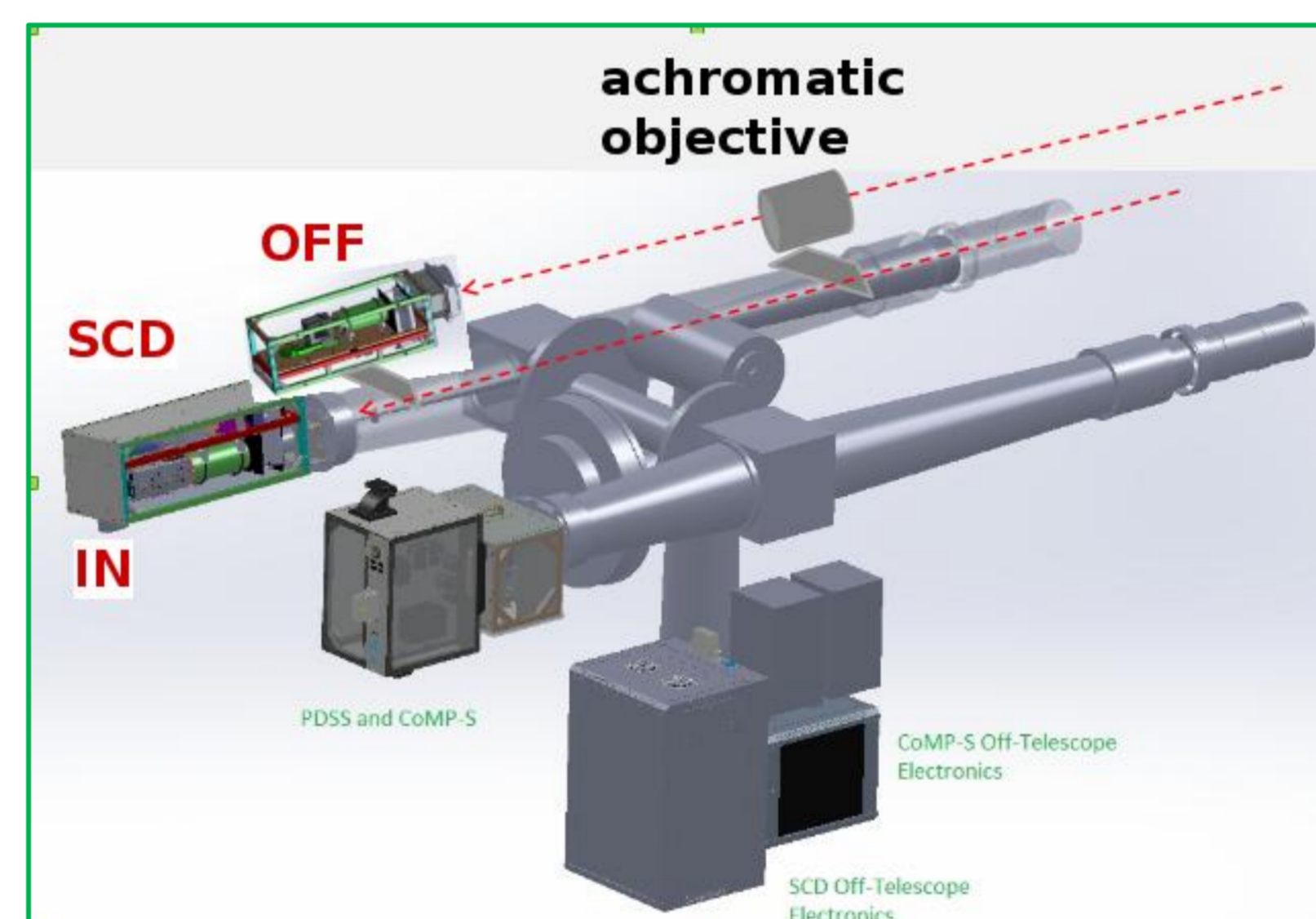
- Quiescent prominence observed on 20 October 2012 at 07:09 UT
- H-alpha profile scanned in 11 wavelength positions in profile, only Stokes I total
- scan time: 20.75 s
- Wavelength steps: in the core: ±0.1 Å, in the wings: ±0.2 Å
- FWHM of filter: 0.45 Å
- post-facto 4 × 4 pixel binning
- Final sampling: 1.3 arcsec/px

Solar Chromospheric Detector (based on concept of COMP-S)

Designed mainly for on-disc observations

Prepared for two possibilities:

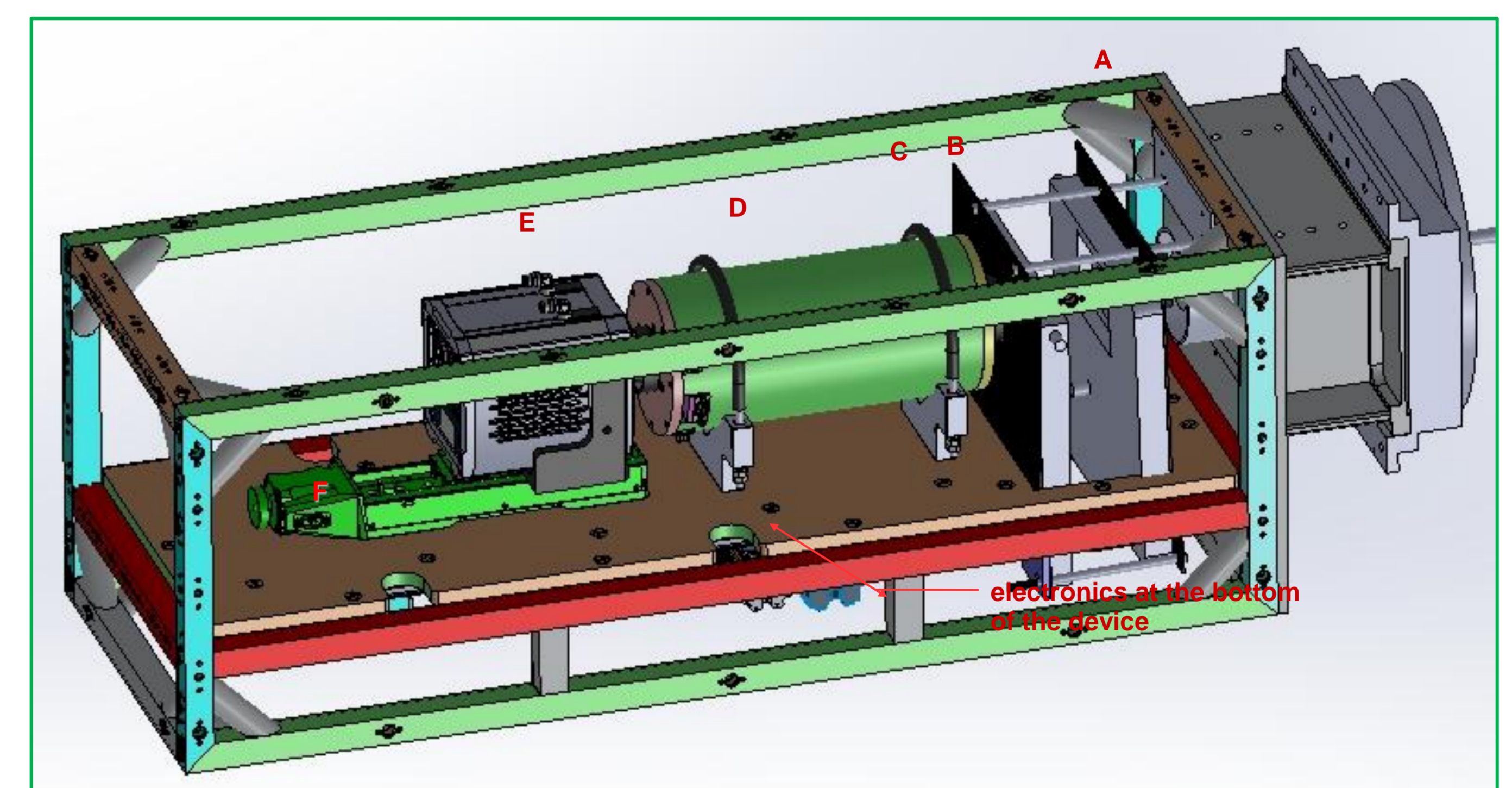
- as postfocus instrument of the left coronagraph – option „IN“
- mounted on tube of the left coronagraph in open optical design with achromatic objective – option „OFF“



Advantages of the two possibilities:

- IN – no mounting points and additional weight on tube of the left coronagraph
- OFF – achromatic objective; no need for changing of focus length for observations in different spectral lines

SCD components and parameters



A: mechanical interface,

B: carousel prefilter: lines selection in 5000-11000 Å, chromospheric: He I 587.6 nm, Na I 589.6nm, H I 656.3 nm, Ca II 849.8 nm, Ca II 854.2 nm, Ca II 866.2 nm, He I 1083.0 nm
photospheric: Fe I 557.6 nm, Fe I 630.15 nm, Fe I 630.25 nm

C: calibration carousel

D: 5-stage tunable Lyot filter with polarimeter (two ferro-liquid crystal polarizers) FWHM from 0.12 (at 5500 Å) up to 0.46 Å (at 11000 Å).

E: Camera: Andor Neo sCMOS

F: pointing device for camera

Dimensions height, length, width: 30x110x40 cm