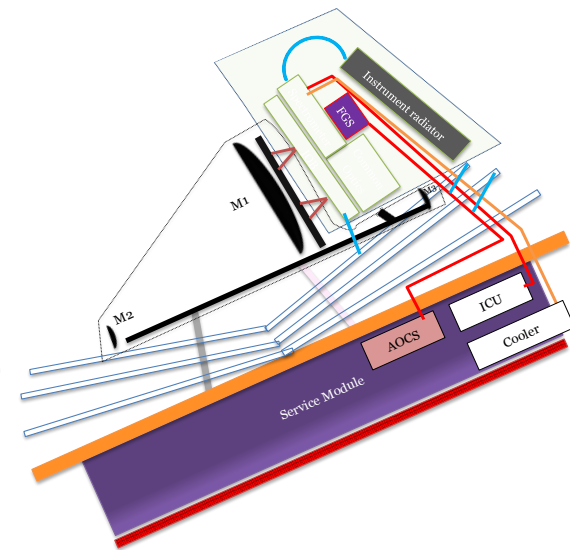


Instrument AO debriefing EChO

L. Puig

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1. Main science goal: to study the physics and chemistry of the atmospheres of a representative sample of known exoplanetary systems found around nearby stars.
2. Soyuz launch in 2022 to S/E L2.
3. 5 years nominal lifetime (6 years goal).
4. Instrumentation:
 - a. 1.2 m telescope, 3 mirror Korsch, off-axis, afocal.
 - b. Spectrometer covering 0.55 to 11 micron (0.4 to 16 micron goal).
 - c. Several detector possibilities (e.g. CCD, HgCdTe, Si:As).
 - d. PLM passively cooled below ~ 45 K.
 - e. Active cooling required for lower temperatures.
5. Fine Guidance Sensor on Instrument Bench for fine pointing.
6. General S/C configuration: "horizontal" accommodation (Planck-like), with Sun below SVM and thermal shields.
7. Science ground segment responsibilities to be shared between ESA and the instrument consortium.



1. AOCS (values are 3σ half angles, around pitch & yaw axes of telescope pointing frame).
 - a. RPE of 60 mas for 90 s.
 - b. PRE of 30 mas up to 10 hrs.
2. Optics:
 - a. Diffraction limited at 5 micron (requirement at shorter wavelengths is TBD).
 - b. Collimated beam (\varnothing 37 mm) at exit pupil.
3. Mass:
 - a. 121 kg in PLM
 - b. 137 kg in SVM.
4. Power: 350 W.
5. Data: 35 Gbit/week.
6. Volume in PLM: $\sim 1200 \times 300 \times 740$ mm³.
7. Critical cryogenic interfaces:
 - a. 300 mW available at 45 K (on 3rd V-groove).
 - b. Additional heat sinking at intermediate stages possible (on other V-grooves).
 - c. Extra 0.6 m² of instrument radiator area (for detector cooling).
 - d. Active cooling proposed shall demonstrate sufficient margins.