

ESA SSA Lagrange mission to L5 point

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ESA SSA Programme Office, ESOC, Germany

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Enhanced Space Weather Monitoring System



L5

Forecasting
&
Event detection



L1



Impact & State
monitoring

D3S:

- Hosted payloads
- SmallSat missions

Measurements from L5

- Solar disk magnetic field
- EUV imaging
- Solar X-ray flux
- Solar wind characteristics
- Interplanetary magnetic field
- Solar proton, electron and ion flux

Heliospheric imaging

Wide-angle coronagraphy



Lagrange mission Phase A/B1 studies



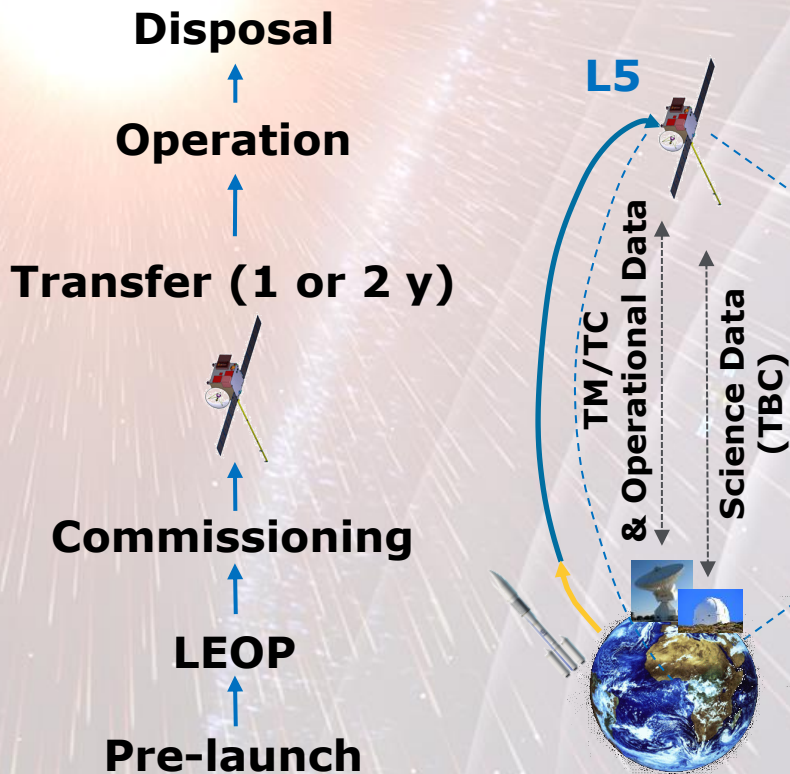
- Two parallel Mission System Studies
 - Consortia led by
 - Airbus Defence & Space
 - OHB System AG
- Remote Sensing Instrument Study
 - Consortium led by RAL Space
- In-situ Instruments Study
 - Consortium led by MSSL

AIRBUS



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MULLARD SPACE SCIENCE LABORATORY

Mission architecture



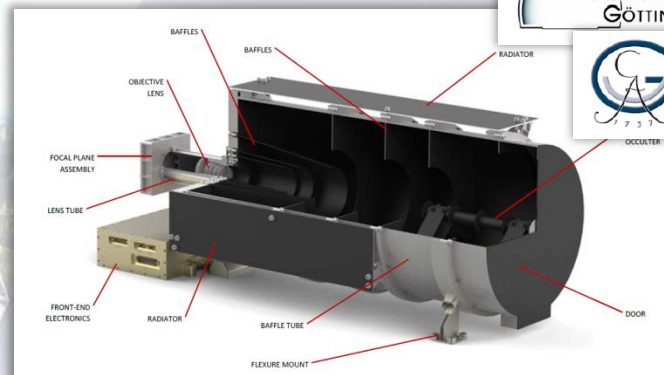
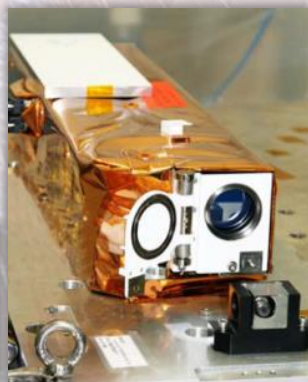
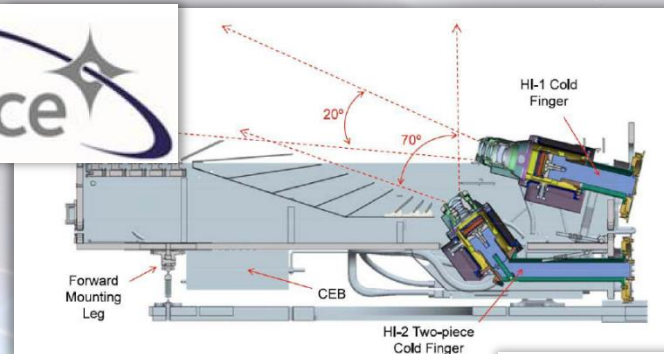
24/7 operation using ESTRACK



Science data via optical link

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Remote Sensing Instrument Package



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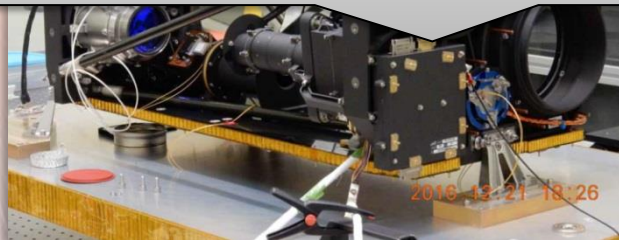


European Space Agency

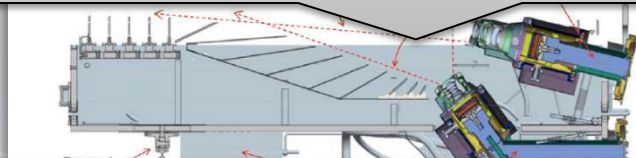
Remote Sensing Instrument Package



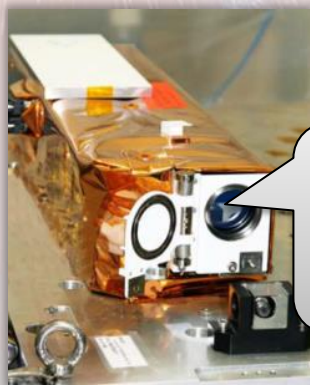
- Vector magnetograph
- Spatial resolution: 5 (2) arcsec
- Dynamic range: ± 4 kG, 12 bits



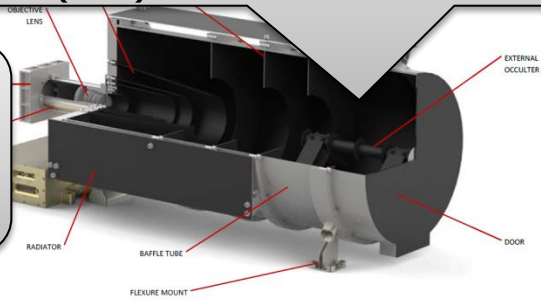
- FoV: 10 to 60 deg (4 to 60 deg)
- Spatial resolution: 4 arcmin
- Accuracy: 20% of CME signal



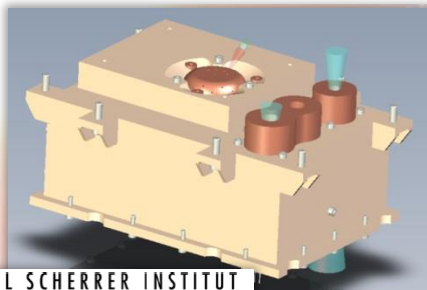
- FoV: 3 - 22 Rs (2.5 - 30 Rs)
- Spatial resolution: 2 arcmin
- Accuracy: 20% of CME signal, SNR > 2 (>4)



- T: Full disk image in Fe XII 193 Å line
- G: also He II 304 Å and Fe VIII 131 Å
- Spatial resolution: 5 (2) arcsec



In-situ Instrument Package

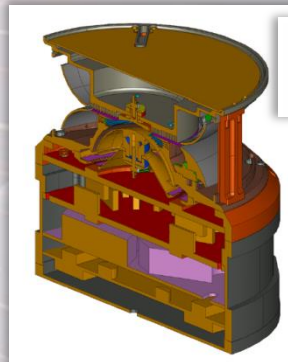


PAUL SCHERRER INSTITUT
PSI

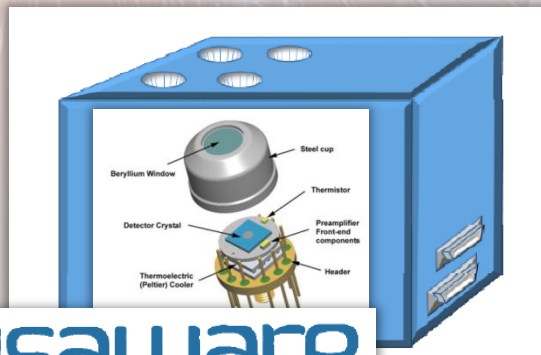
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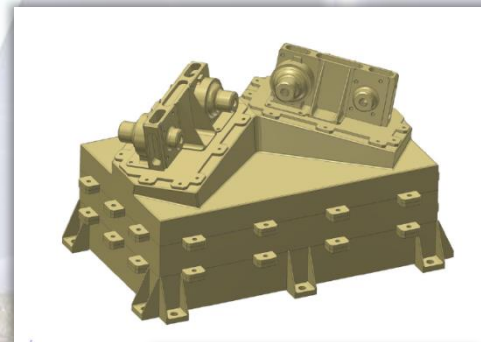
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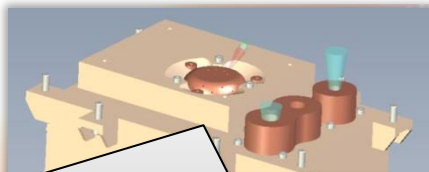
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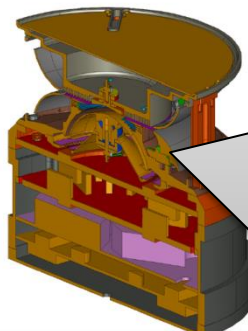
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Kiel University
Christian-Albrechts-Universität zu Kiel

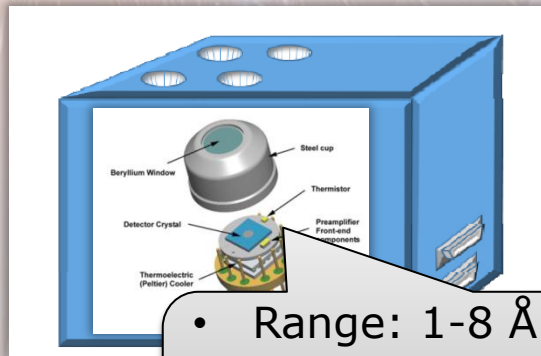
In-situ Instrument Package



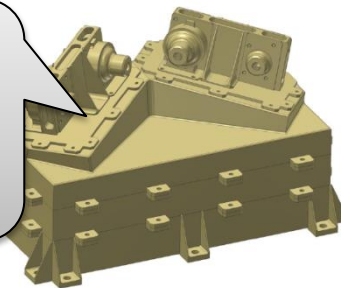
- Electrons: 100 keV to 7 MeV
- Protons: 2 MeV to 200 MeV
- Heavy Ions



- Velocity range: 200 to 2500 km/s (100 to 3000 km/s)
- Density range: 0.1 to 150 cm⁻³ (0.1 to 200 cm⁻³)
- Temperature range: 40,000 to 1,000,000 K (10,000 – 2,000,000)



- Electrons: 30-600 keV (1 MeV)
- Protons: 60 keV to 2 (8) MeV
- Dual FoV, 120 deg cone, backwards and sideways



- Range: 1-8 Å (0.5-8 Å)
- Dynamic range: 2x10⁻⁸ to 2x10⁻³ W/m²
- Accuracy: 15%



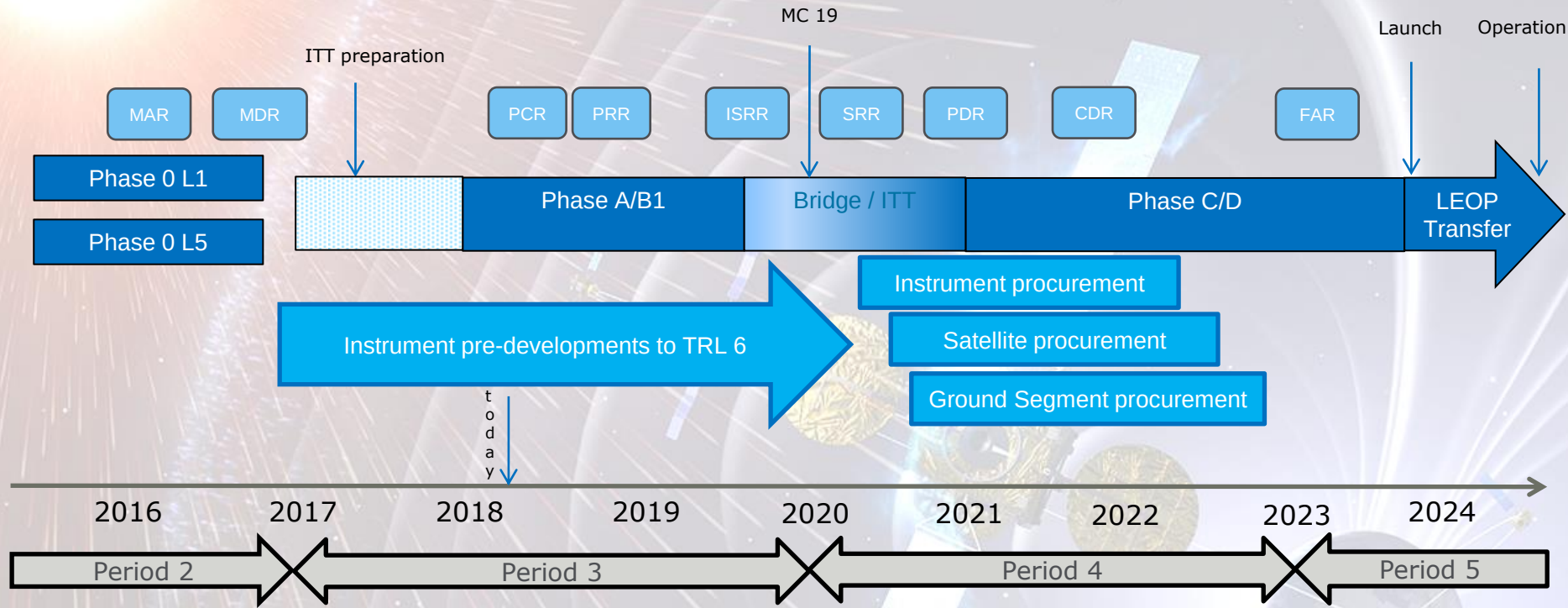
- IMF vector (3-components)
- 0.1 to 200 nT
- Accuracy: ± 1nT (± 0.5 nT)

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Lagrange Mission Roadmap





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