

The THESEUS Ground Segment

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In this talk

- Ground segment components
- Observation scheduling
- AO handling
- Data handling
- Community Support

Ground Segment

- MOC, SOC, SDC, IOCs, TBAGS
 - MOC: mission operations centre (ESA)
 - SOC: science operations centre (ESA)
 - SDC: science data centre
 - IOCs: instrument operations centres
 - TBAGS: Theseus burst alert ground segment

Scheduling

- Aim is to detect GRBs in polar regions
- There is some flexibility in pointing strategy
- Streamlined scheduling
 - Fully autonomous spacecraft (detect, validate trigger, slew, observe, transmit, return to survey)
 - Nominal scheduling by upload of target list
 - Mostly automated processing and response to TOO's

AO Handling

- Central ESA Proposal Handling System
 - NLP-based processing of proposals
 - AI-supported review process
 - Distributed TAC
 - ML-based system evaluation and self-improvement

Data Handling

- Centralized data handling
 - SOC processes TM into L0
 - SDC processes L0 into L1+
 - Archive contains all data
 - Data access through ESA archive
 - Data processing through ESA Datalabs

Community Support

- Distributed expert support
 - SOC — hosting and coordinating
 - IOCs — instrument-specific questions
 - SDC — software-related questions
 - Consortium — science-related questions

Conclusion

- Automated spacecraft is new and different
 - Allows extensive automation in operations
 - Inspired much new developments
- Major novelties:
 - Scheduling
 - Data access is through ESA archive
 - Science processing through ESA Datalabs
 - AO and TAC through ESA PHS