Daksha On Alert for High Energy Transients www.dakshasat.in



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A detour: IITB SSP



https://www.aero.iitb.ac.in/satelliteWiki/index.php/Satellite_101



Attempts have been made to keep this wiki as general as possible, so as not to bias the viewer in any way towards any particular design. You can expect the following from this wiki

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Daksha

Continuous all-sky coverage Large effective area Broadband: 1 keV – 1 MeV Two satellites

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Daksha: vital statistics

- Broadband energy coverage: 1 keV to > 1 MeV
- Median effective area: 1300 cm² (single sat)
- Sky coverage: 1 satellite ~50%, two ~ 87%
- Event alert within ~1 minute

- Downlink all event mode data
 - 1 microsecond time tagging
 - Offline searches possible

Pointing



Daksha



Low Energy (LE): Silicon Drift Detectors Range: 1 – 25 keV 13 boxes with 5 detectors each Used for Chandrayaan XSM

Medium Energy (ME): Cadmium Zinc Telluride detectors Range: 20 – 200 keV 17 boxes with 20 detectors each Used in AstroSat CZTI, RT2, etc

High Energy (HE): Sodium Iodide scintillator with Silicon Photo-Multipliers (NaI + SiPM) Range: 100 keV – > 1 MeV Four detector units

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Single satellite effective area

Effective area



Median: ~1300 cm² for single satellite

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Science goals

Key Science

- EMGW
 - Highest "grasp" of any missions!
- GRBs
 - High redshift
 - Prompt soft spectra
 - Fine time-resolved study
- Polarimetry
 - 10+ bursts / year

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Secondary Science

- X-ray pulsars
- Magnetars / SGRs
- TGFs
- FRB counterparts
- Earth Occultation imaging
- Solar Flares
- Probing primordial black holes

Daksha + EMGW

- Rates: ~ 10 events / year
 - EMGW Range 1–20/year
 - 2-15× Fermi, 8× Swift

- Subthreshold events
 - Increase GW rates!

Comparing missions

Grasp

- Daksha has the highest grasp of any mission
- BAT-like sensitivity over the entire sky
- Wider spectral band



Daksha Status







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What's next?

- Vibration testing ~ this month
- Thermal cycling: ~ Oct end

• Next: Proposal evaluation for full mission

- Post approval:
 - Massive effort to screen, build, calibrate...
 - Launch timescale: before O5 (2025 2026)

Thank you!

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