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DREAM INSTRUMENT MINIATURISED CHARGED PARTICLES SPECTROMETER

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What for?



Track charged particles in space •

> More points in space are required to better understand these effects

•	During	geomagnetic storm,	density variation	is very quick
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- Better data refreshment and coverage
- That is why at CNES level we want a miniaturised spectrometer •
 - A mandatory step to develop a swarm of charged particles spectrometer







DREAM Architecture





- And digitalisation offers new characteristics
 - Capacity to discern very closed particles (less than 280ns)
 - Possibility to record raw data and send back to earth for deep investigation





Focus on particle sensors

• Lots of efforts to miniaturise them, sensor A















A conception with agile development

Breadboard 2-3 sprints To quickly improve performance of each function













Qualification is ongoing



- Mechanical and thermal analysis done
- Destructive SEE tests performed at component level done
 - One reference needs to be replaced (temperature sensor)
 - One reference is still ongoing (ADC, due to long time procurement)
- EMC analysis has been performed in our anechoic chamber









Performance measurement

- Protons at UCL : 10MeV 62MeV
- Protons at Partrec : 50MeV 184 MeV







Performance measurement

Comparison with GEANT-4 simulations for protons





DREAM specifications

Key figures

Parameters	DREAM	
Weight	<400g	
Consumption	2,5W typ	
Size	95x95x50 mm	

Payload identified in AEROSAT program

- Launch expected in 2025
- 3U satellites, developped by Nanolab Academy from CNES



• A complete qualification document will also be available to seize opportunities on next coming missions





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THANK YOU FOR YOUR ATTENTION

QUESTIONS ?

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