

FedSat: Three Years of Space Science & Technology



Andrew Parfitt and Brian Fraser
Cooperative Research Centre for Satellite Systems



Ka-Band Communications

Contact: Professor Sam Reisenfeld
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Proven spatial and frequency tracking

20GHz downlink propagation measurements show weather effects on link

Bent pipe capability demonstrated



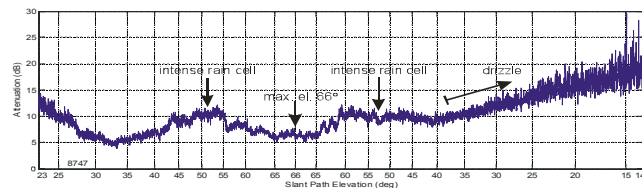
Communications Payload with Ka-band, UHF and On-board Processing Units

ADAM

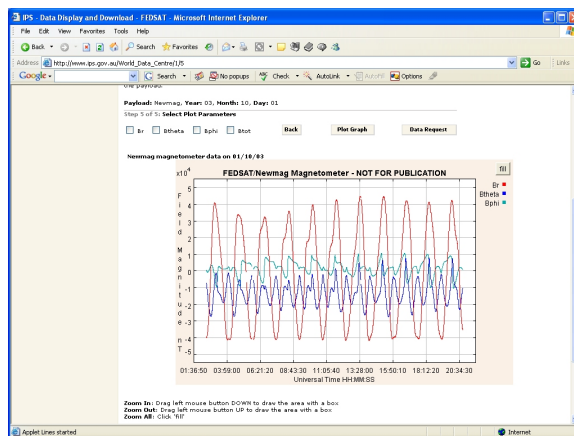
Contact: Professor Bill Cowley
Bill.Cowley@unisa.edu.au

Time-domain burst messaging from multiple ground terminals

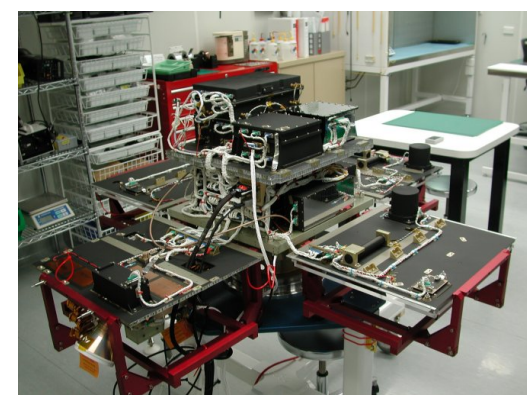
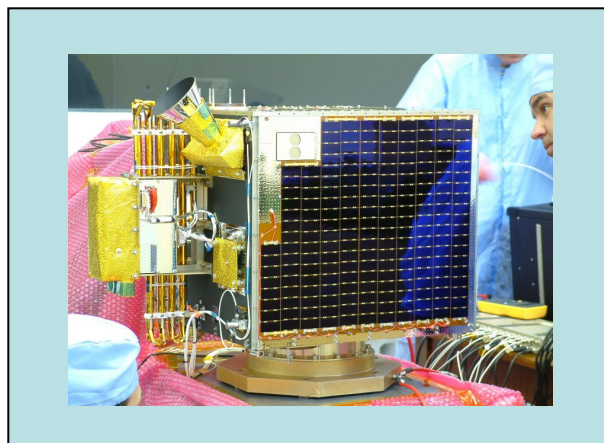
On-board processing and storage capability for data acquisition and messaging



Measured Ka-band propagation through rain cells



NewMag Data on World Data Centre web site



Internal payload and systems view of FedSat

Platform Research

Contact: Mirek Vesely
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Spacecraft system design and modelling

Small satellite methodologies

Operations management and spacecraft control

NewMag Magnetometer

Contact: Professor Brian Fraser
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Calibrated geomagnetic field data for space weather related science

Field aligned current analysis

Killer electron effects

Environment diagnostics for spacecraft failure mechanisms

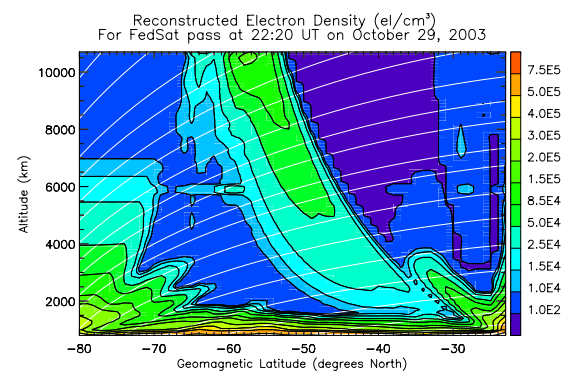
Conjunctions and correlations with other spacecraft measurements

GPS Receiver

Contact: Dr Rodney Walker
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Scientific Data: Professor Peter Dyson
P.Dyson@latrobe.edu.au

GPS data for spacecraft timing, orbit determination and attitude control

Ionospheric occultation measurements based on total electron density derived from GPS data



Tomographic map of electron density based on GPS data

Reconfigurable Spacecraft Computer

Contact: Professor Miles Moody
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Demonstrated autonomous self-healing capability after radiation upset events

FPGA based for high performance on-board processing capability



High Performance Computer Payload

University of South Australia



QUT Queensland University of Technology
Brisbane Australia

UNIVERSITY OF TECHNOLOGY SYDNEY

THE UNIVERSITY OF NEWCASTLE AUSTRALIA



Australian Government
Department of Defence
Defence Science and
Technology Organisation

LA TROBE UNIVERSITY

SPACE