QUADRANT

Dependent Surveillance With Integrity

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Nadi, Fiji – 24th October 2005

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QinetiQ Perspective

- Involved in development of Mode S radar technology and international standards from early 1970s
- Recognised new surveillance techniques evolving from secondary radar
  - Multilateration
  - ADS-B
- Instigated the QUADRANT programme in 2002 to develop relevant technologies and techniques

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Concept

- Low cost, highly deployable sensor array feeding central processor
- ADS-B performance capable of giving 200NM range in a high fruit environment
- Multilateration capability to high accuracy
  - 7.5 m for local area operation
  - 100m for wide area operation
- Ability to combine multilateration and ADS-B techniques to provide integrity approaching or equal to radar

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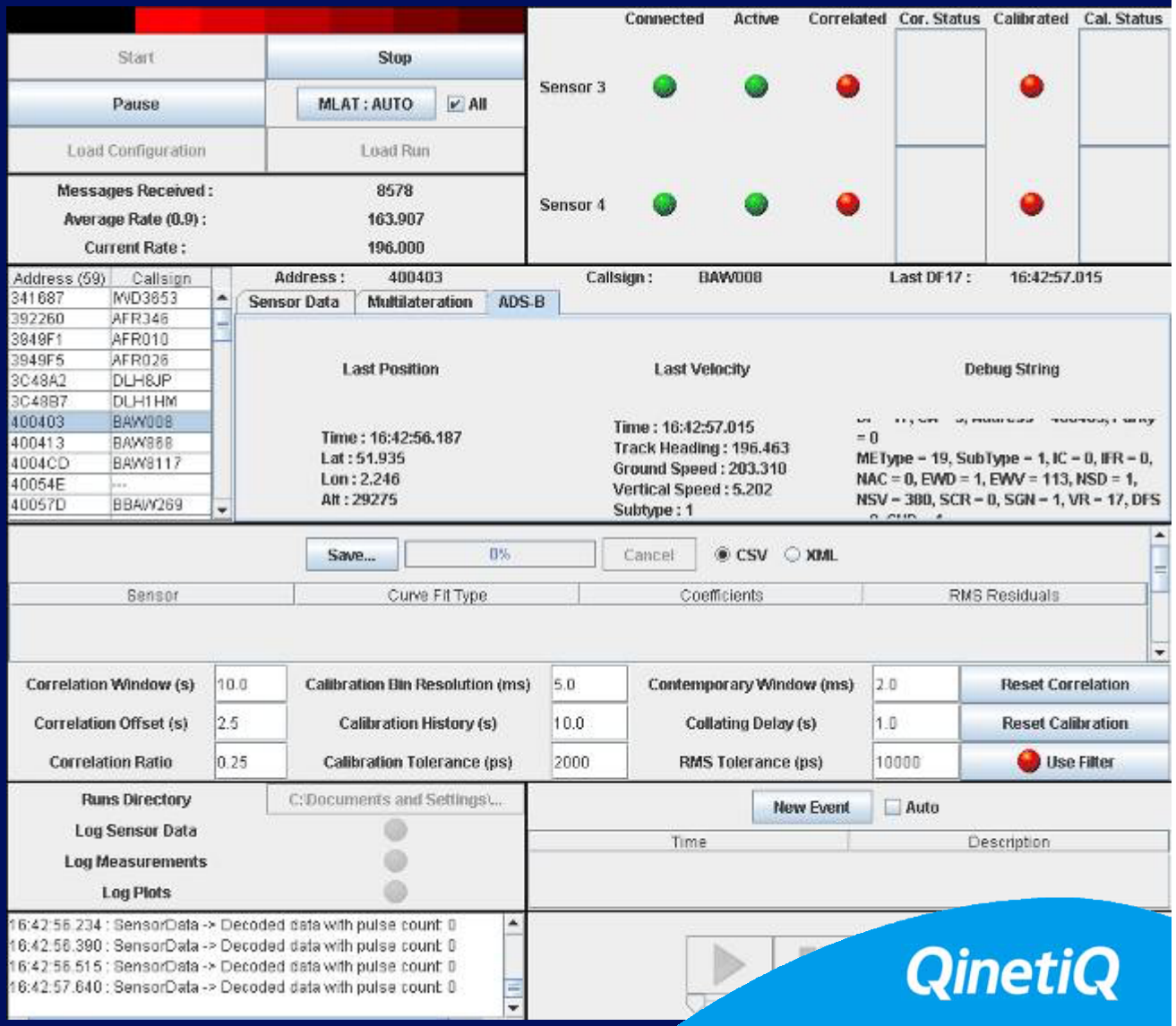
Central controller

- PC based
- Self configuring on available sensors
- Performs continuous diagnostics and calibration
- Generates ASTERIX or user defined output



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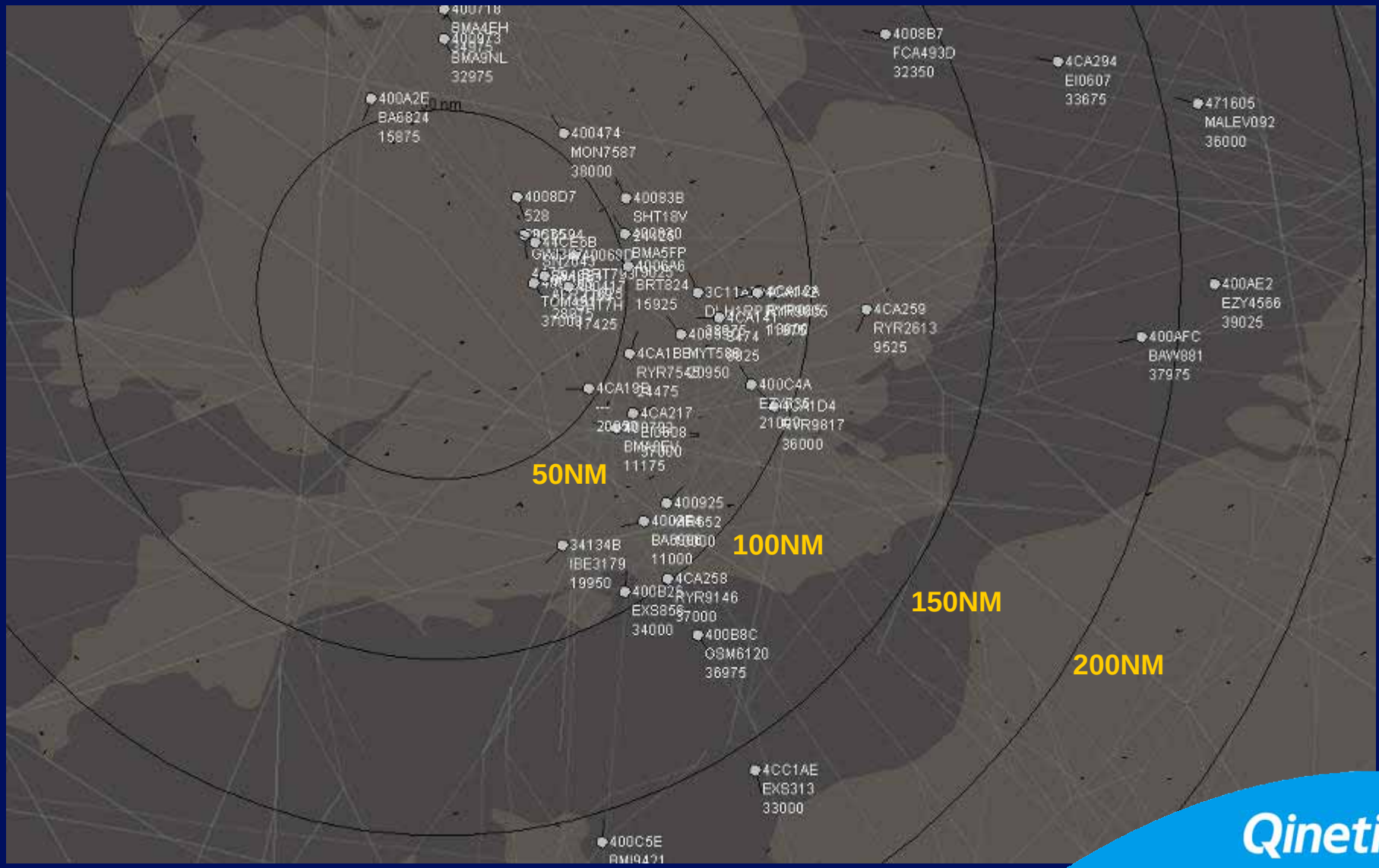
ADS-B



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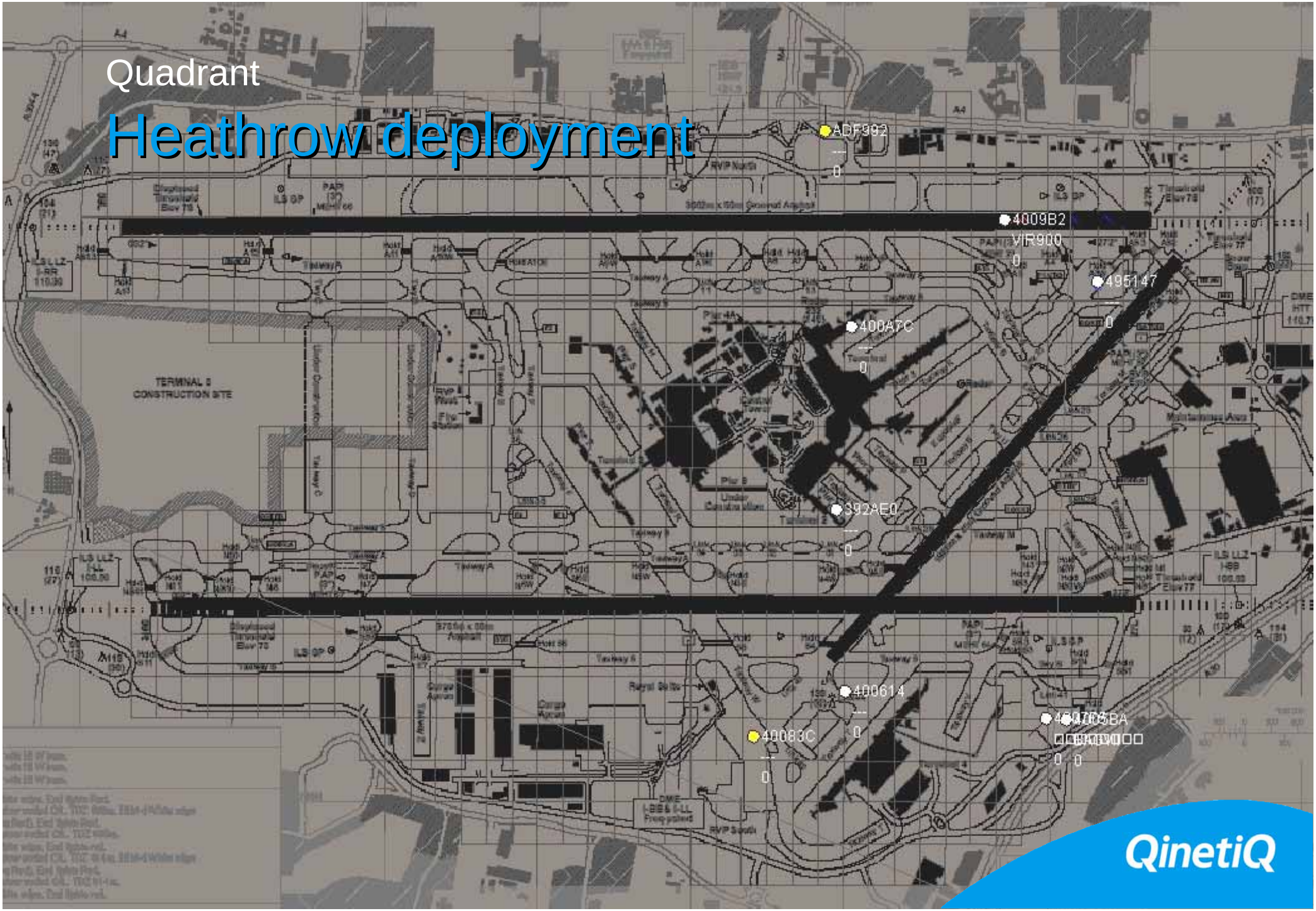
Heathrow deployment



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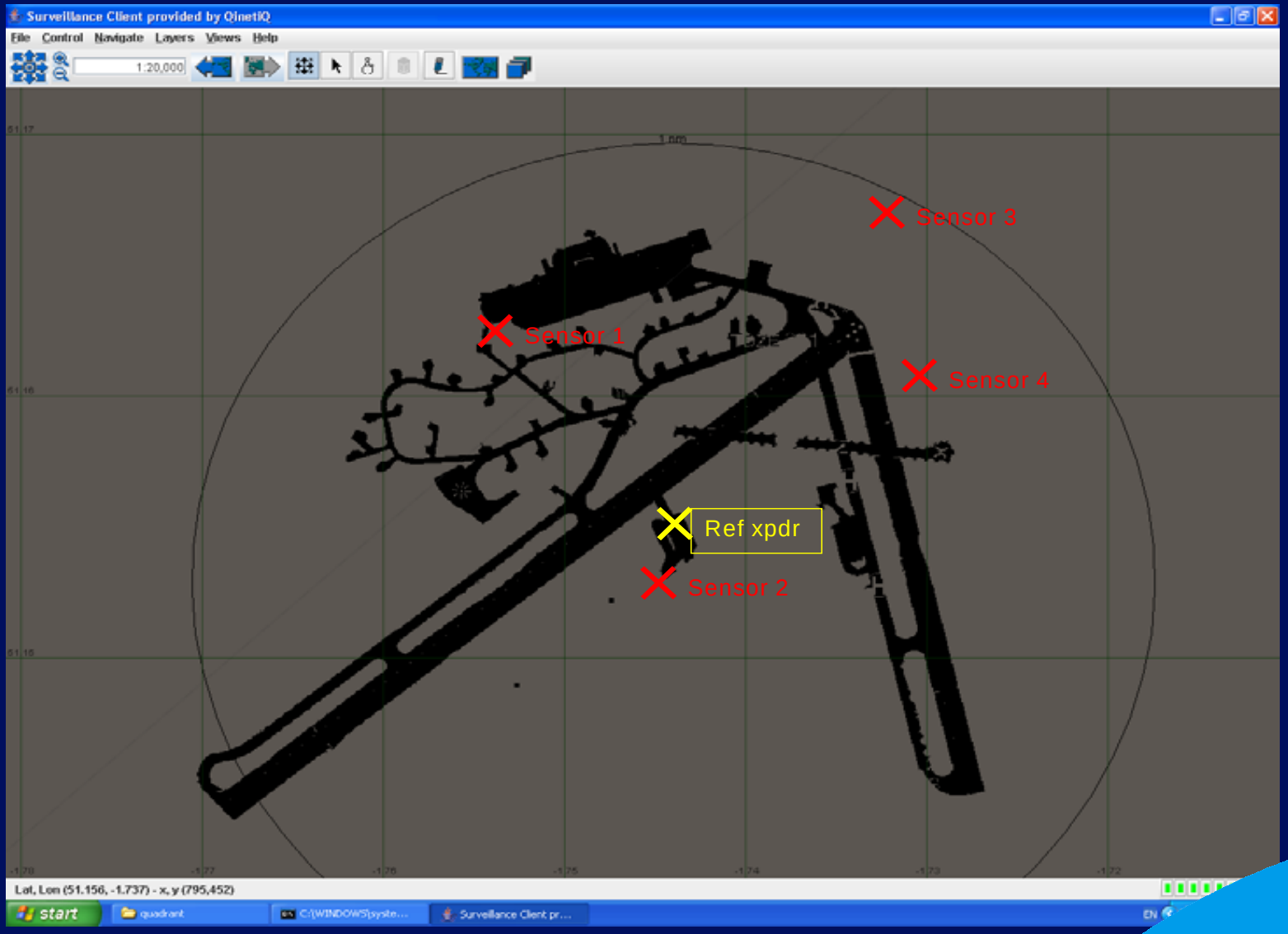
Local area trials (Boscombe airfield trials)



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Multilateration

Pershore Airfield trial

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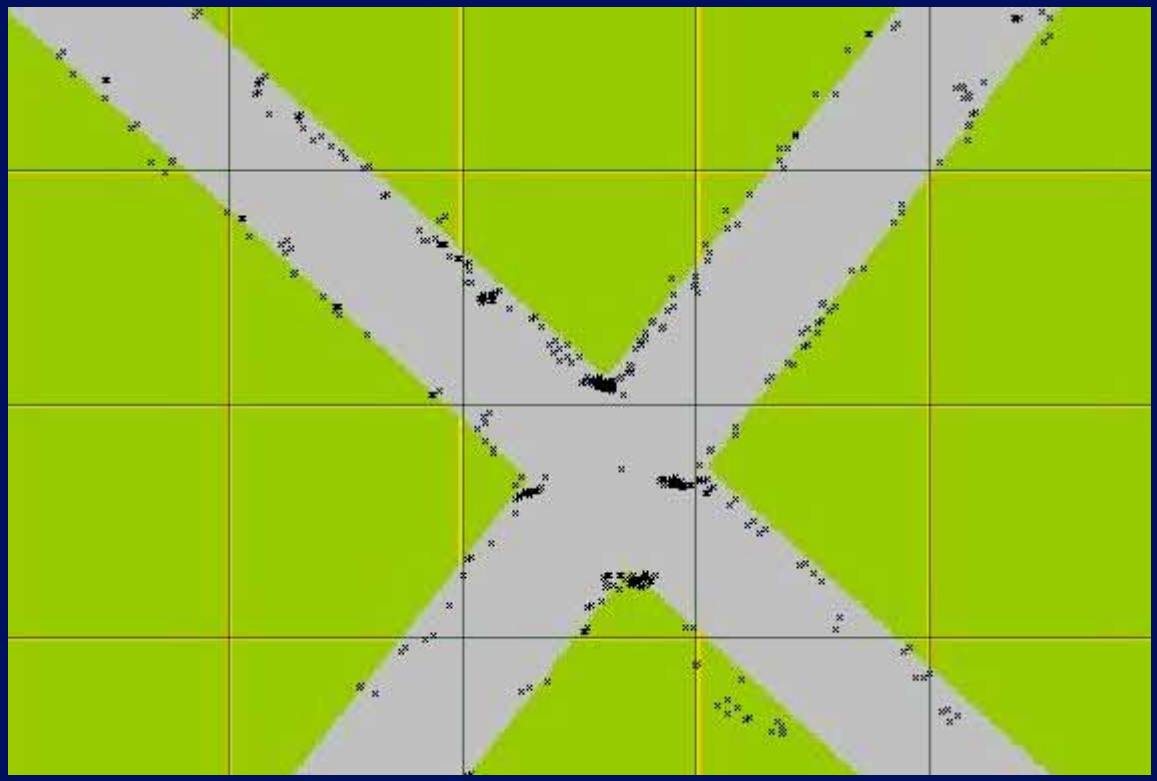
Multilateration

Pershore Airfield trial



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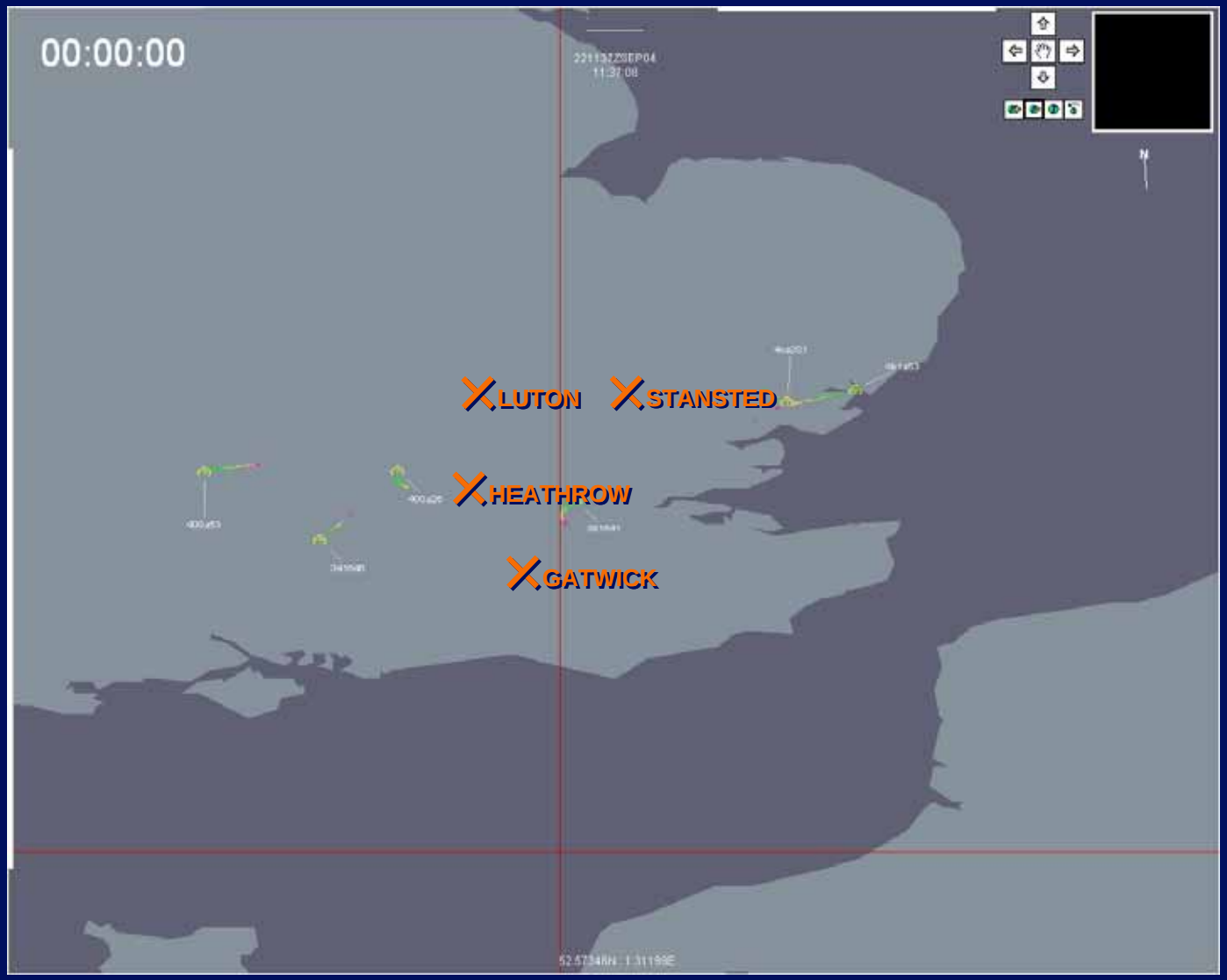
Wide area trials



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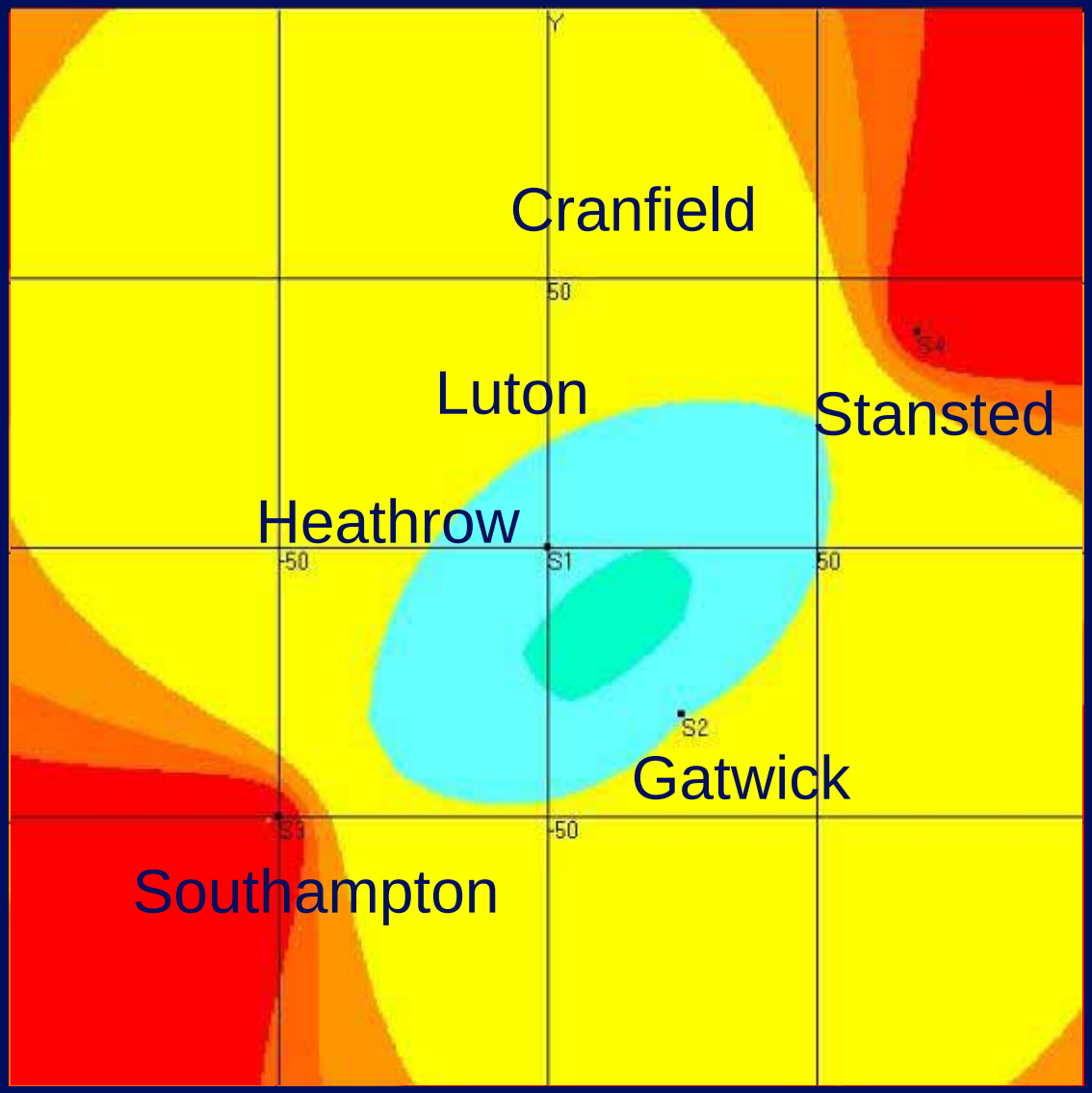
Wide-Area Multilateration Performance



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Integrity

- ADS-B is dependent on accurate reports from the aircraft
- Position integrity is asserted within the messages
  - Not independently verified
- MLAT can be used to provide an independent integrity check, even from a partial MLAT solution
  - Therefore even a basic ADS-B network can perform such checks
  - Sensors will need an MLAT capability

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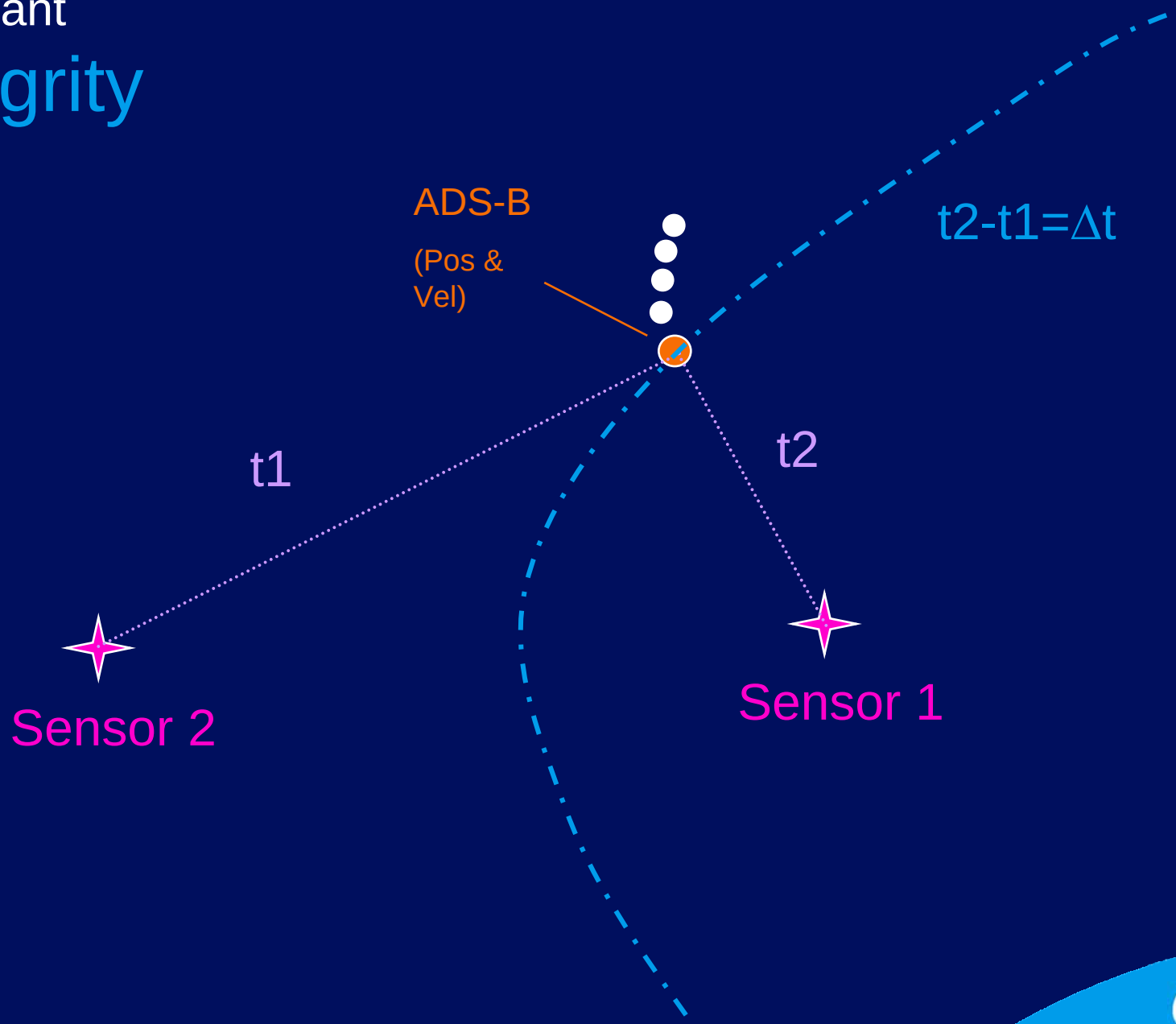
Integrity



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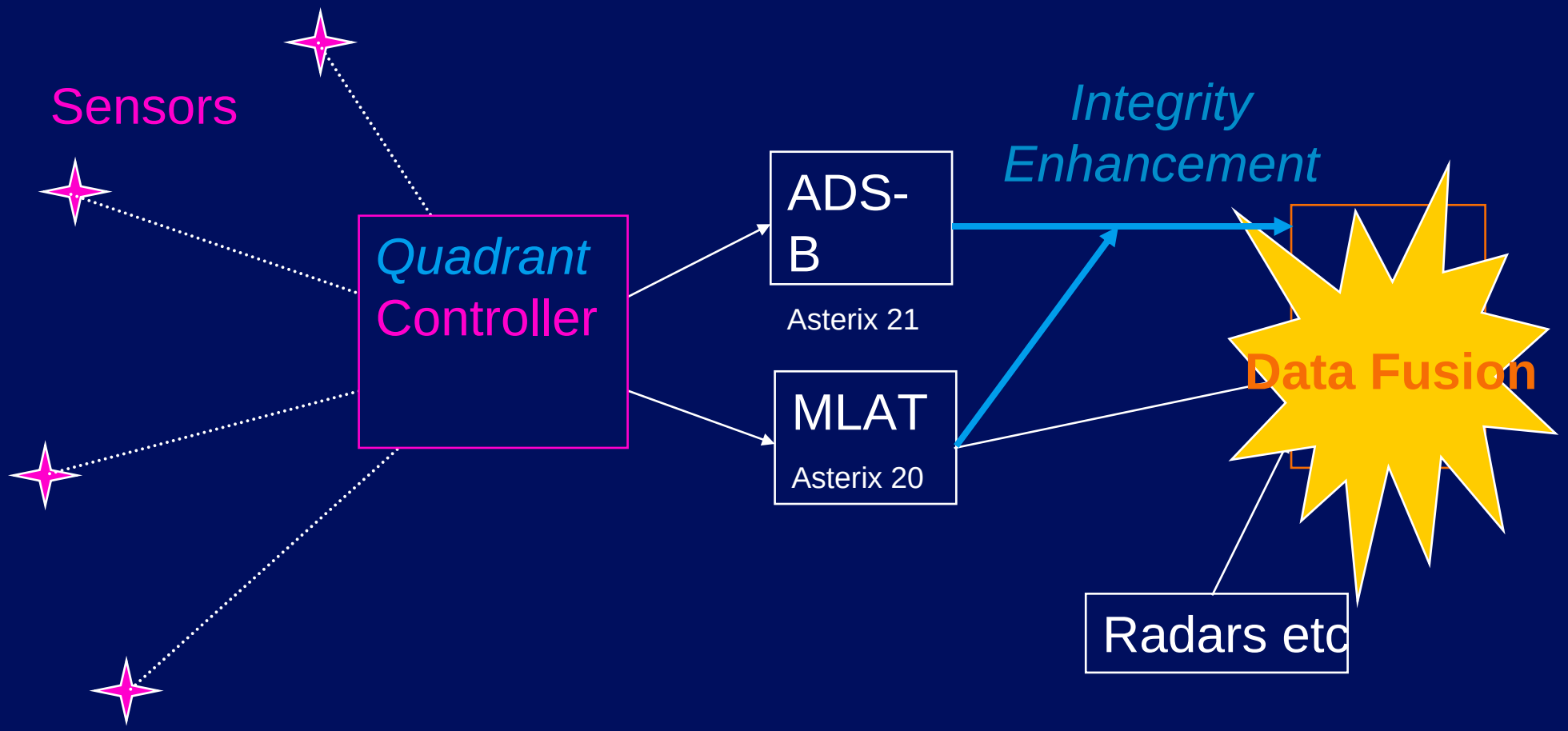
Integrity



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Moving forward

- Ongoing research programme for high integrity ADS-B (Supported and part funding by UK DTI)
- CRYSTAL UK
  - SE UK ADS-B/MLAT evaluation system
  - EUROCONTROL programme, with UK NATS, SITA and Raytheon
- All MLAT products are also ADS-B systems
  - ADS-B product available within 6 months
  - Local Area Multilateration – 12 months
  - Wide Area Multilateration – 12 months

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Demonstration

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