



Supporting
European
Aviation

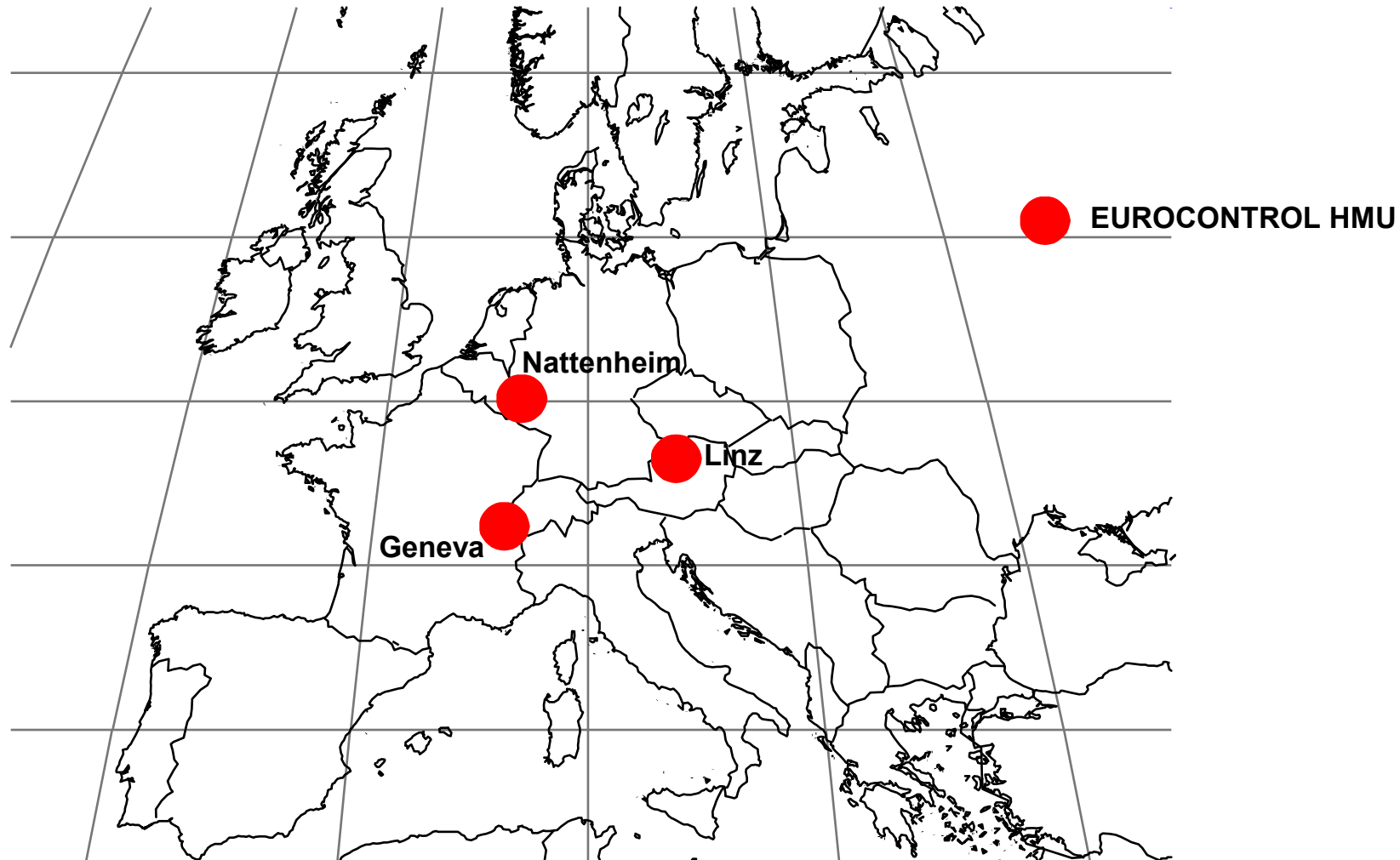


Developments in Aircraft RVSM Height Monitoring in Europe

ASE Technical Data Interchange Meeting
Seattle, 9 – 11 September 2025

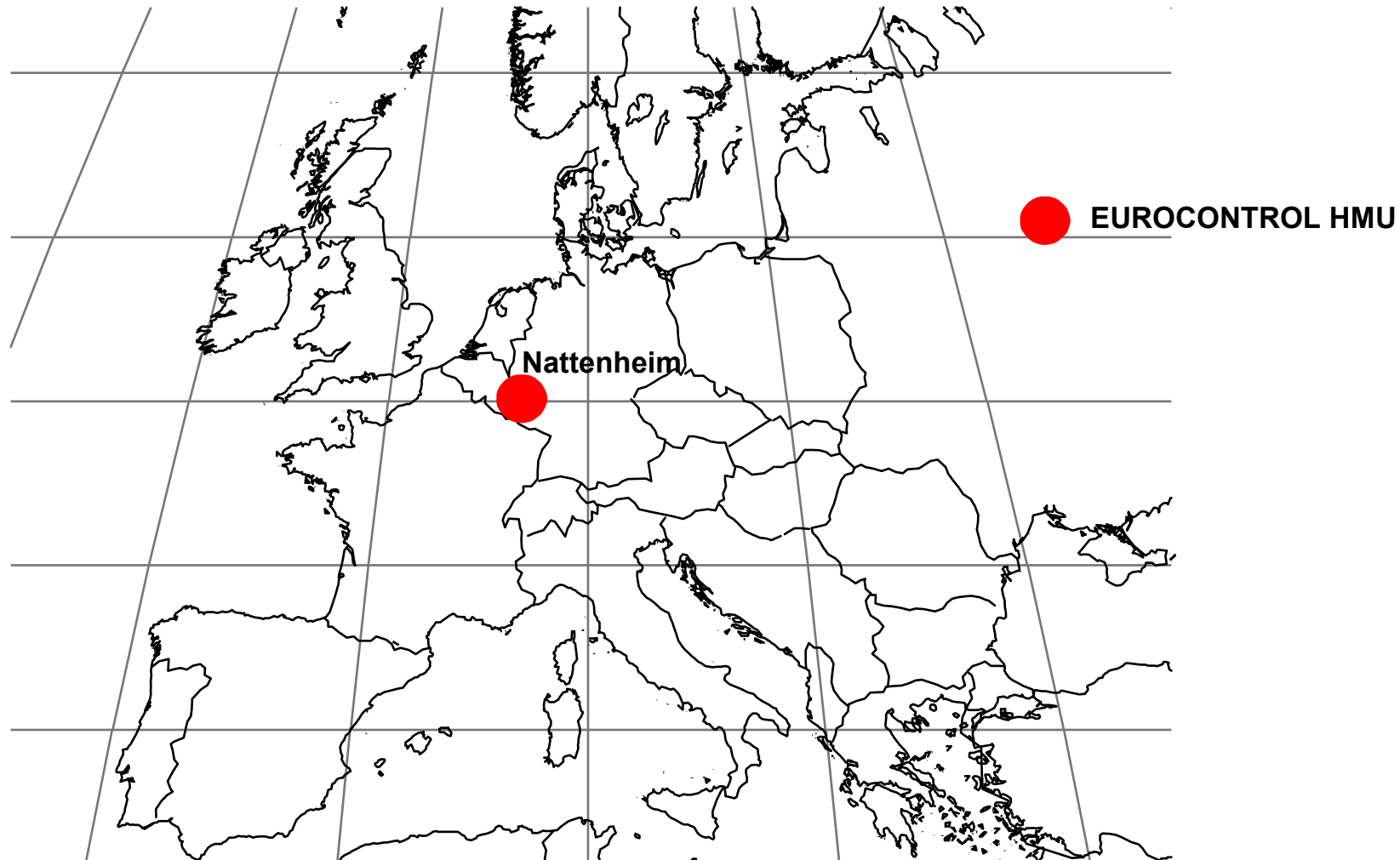
Andrew Lewis
Manager EUR RMA
09 September 2023





- Highly effective - ASE estimation accuracy has been independently verified by manufacturers and operators
- Optimal siting - Ensures > 95% of aircraft operators flying RVSM in Europe comply with ICAO monitoring targets
- Cost effective – Less than €1 operating cost per monitoring result

- Operational for > 20 years with only one major design modification – Obsolescence issues becoming more problematic
- Bespoke nature of the product increases development costs to impractical levels
- Lack of support for any additional RVSM related costs
- Linz HMU removed from service in 2025
- Geneva HMU to be removed from service in 2026

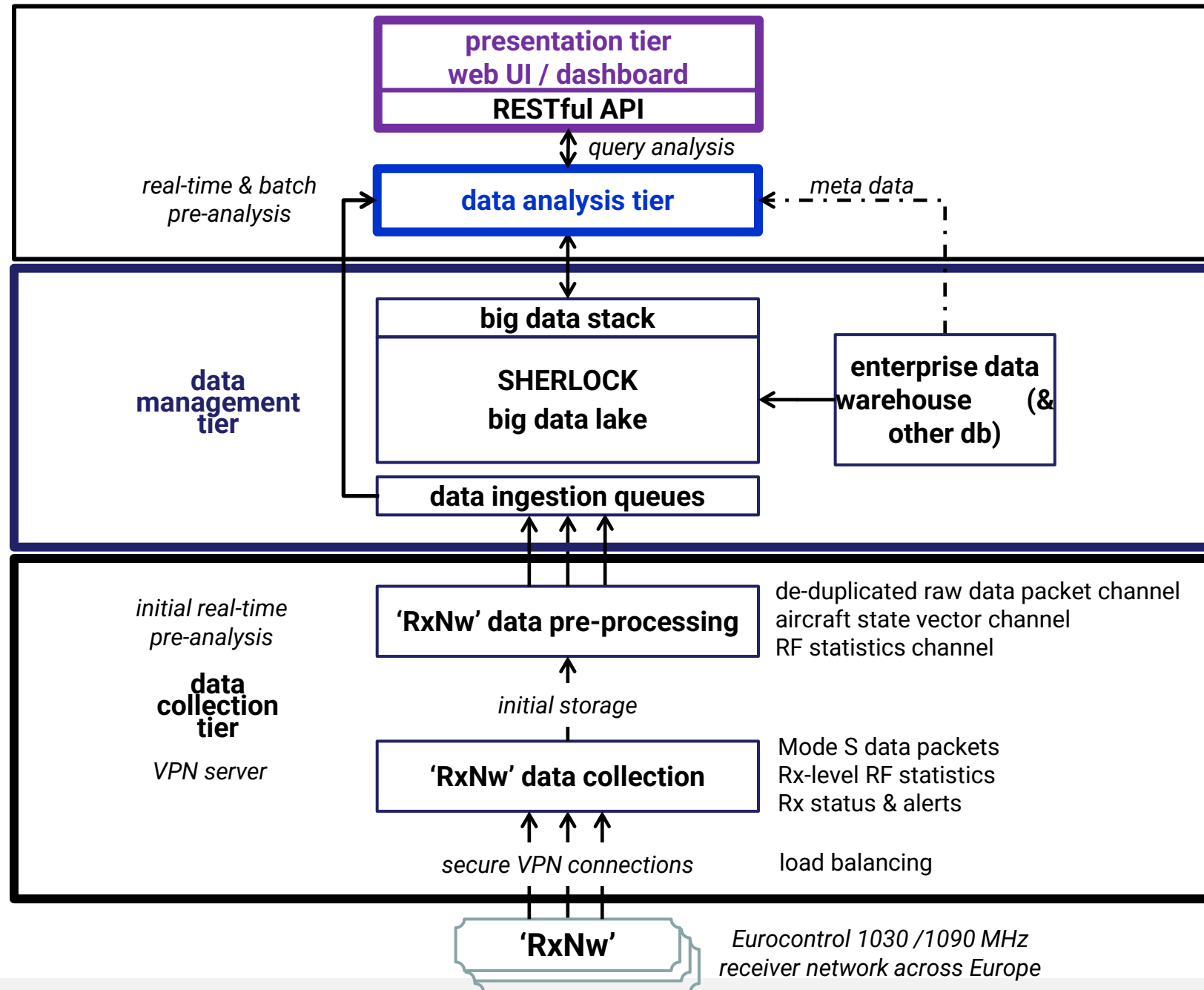


- EUROCONTROL was selected as the European Network Manager by the European Union, mandated to implement the European Network Manager Implementing Rule (EU) 2019/123
- RF Monitoring
- GNSS RF Interference
- Monitor ADS-B performance and detection of data anomalies
- Monitor Mode S Interrogator performance
- Monitor function of ACAS
- Assess aircraft altimetry system performance
- EUROCONTROL has installed 80+ ADS-B receiver sites throughout Europe, to support these monitoring functions

- The total monitoring function was defined as:
- Surveillance Interrogators and Avionics, ACAS and Altimetry Monitoring (SIAAAM)
- The analysis platform was defined as the SIAAAM Data Collection, Management and Analysis platform (SDCMA)

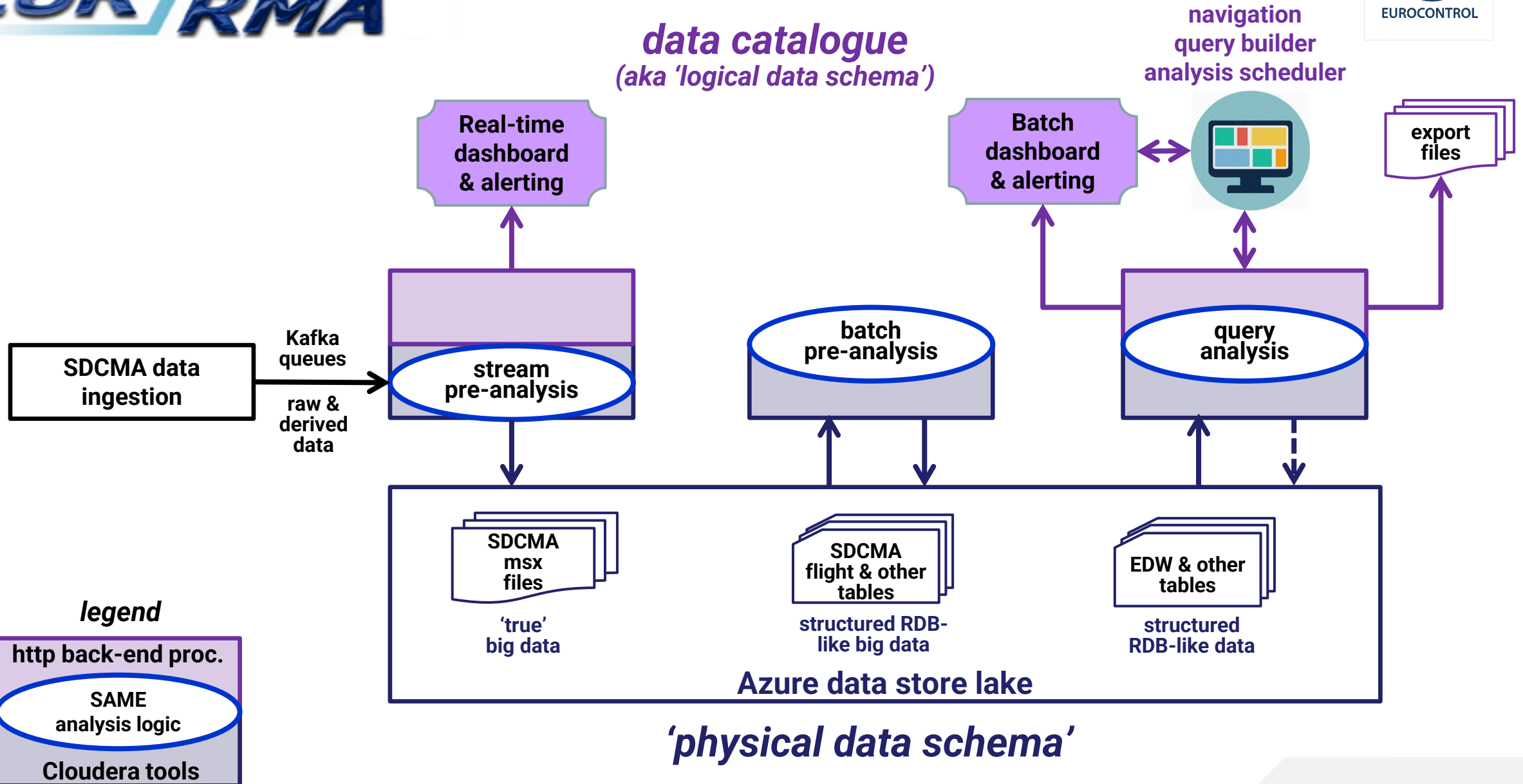
SHERLOCK

A big data platform which offers vast processing powers to provide increased capabilities for the processing and analysis of large data sources in near real time environments



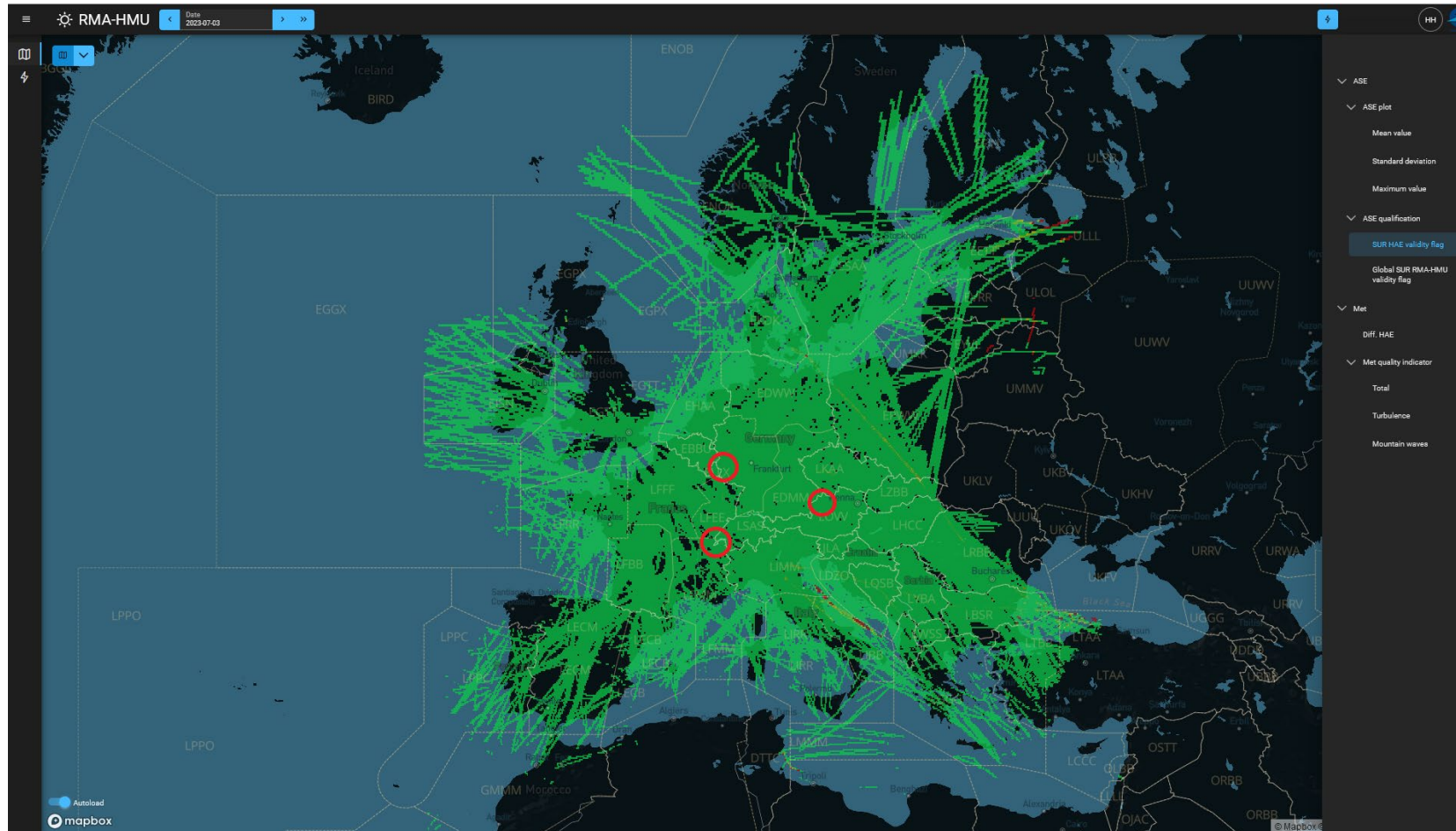
SHERLOCK Platform Tiers

data catalogue
(aka 'logical data schema')





European RVSM Monitoring The Future



Initial Comparison HMU v SHERLOCK

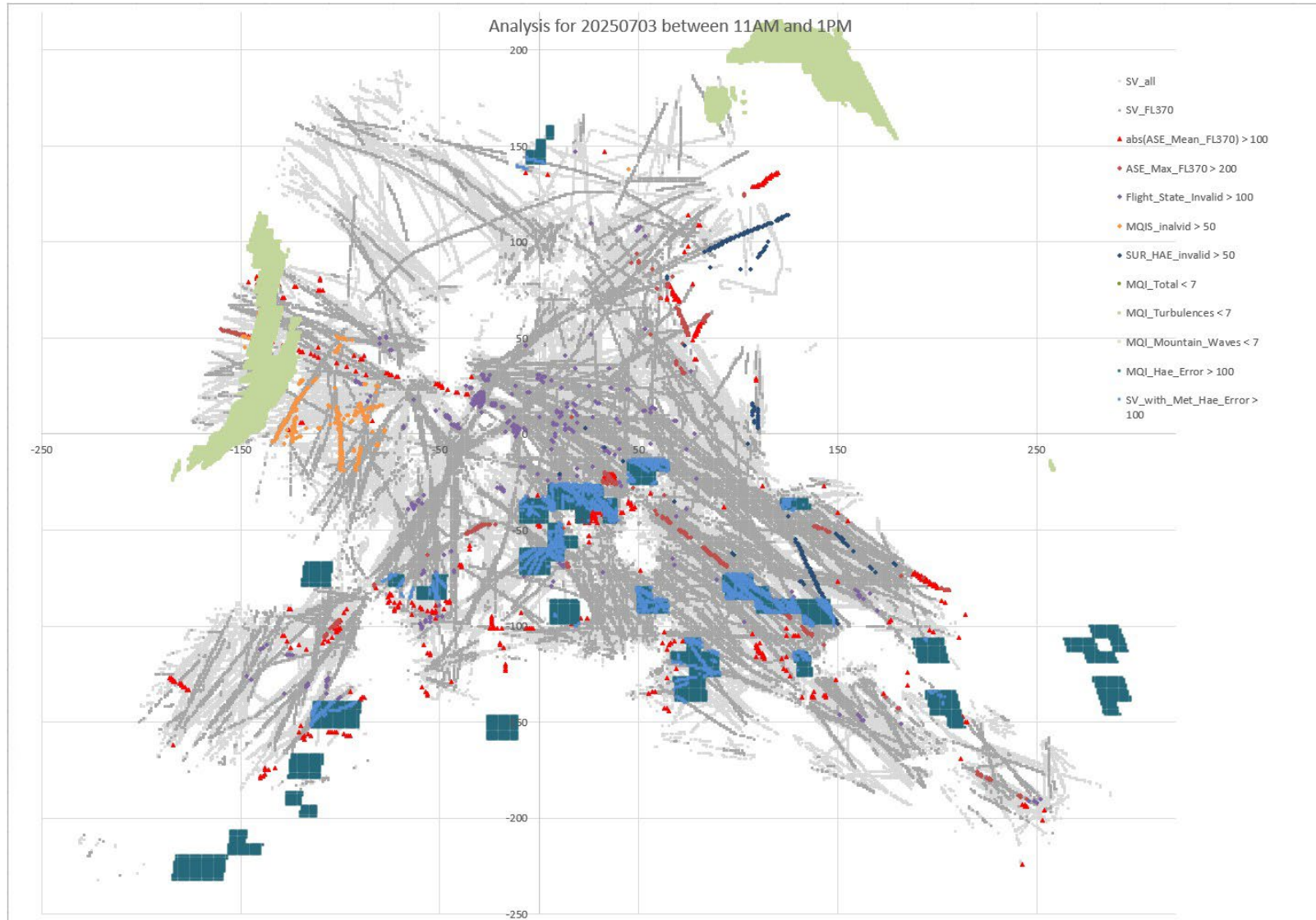
HMU	GVA		NTM		Total
Date	23-04-2025	24-04-2025	23-04-2025	24-04-2025	
Number of Tracks	1131	1265	1197	1290	4883
Average Difference (ASE)	-5,96	8,5	-0,23	10,71	
Difference in lowest value ASE	-69,6	-48,5	-193,1	-31,1	
Difference in highest value ASE	55,1	76,4	57,8	82,3	
Standard Deviation in ASE	20,24	19,66	15,15	13,38	

85% of coincident tracks < 25 ft. Diff

99.7% of SHERLOCK tracks were within 3 sigma SD of HMU tracks

Statistical Regional Analysis of SHERLOCK Data

Day	tracks	min_ase	avg_ase	max_ase	stddev_ase
2025083100	65292	-490	7.26	226	41.84
2025083000	64911	-238	9.29	1564	41.57
2025082900	66370	-254	0.61	785	42.64
2025082800	67354	-253	8.52	266	42.6
2025082700	68751	-244	4.25	706	40.94
2025082600	68541	-396	11.54	482	40.32
2025082500	64646	-794	10.44	920	40.5
2025082400	68863	-650	8.75	613	40.16
2025082300	72181	-239	7.95	217	40.06
2025082200	69217	-342	8.72	231	40.06
2025082100	69351	-249	7.38	282	40.8
2025082000	67742	-1518	8.42	468	41.82
2025081900	68003	-244	11.99	1714	40.97
2025081800	66922	-260	15.23	232	39.71
2025081700	68539	-221	13.42	239	40.3
2025081600	70798	-288	15.74	347	40.55
2025081500	69549	-219	13.89	241	39.81
2025081400	67216	-218	11.3	214	39.57
2025081300	66884	-3500	14.15	219	42.88
2025081200	66987	-2947	7.18	218	43.18
2025081100	64920	-227	11.57	312	40.48
2025081000	68747	-248	13.91	457	40.19



- Complete optimisation of SHERLOCK filter parameters
- Complete external analysis tools
- Provide validation report to ICAO European Aviation Systems Planning Group and EASA
- Transition to SHERLOCK as principle means of RVSM height monitoring in 2026
- Retain Nattenheim HMU in service to accommodate non ADS-B version 2 aircraft

Thank you for your attention



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