

DYNCAT



Reducing the environmental footprint of arrival flights

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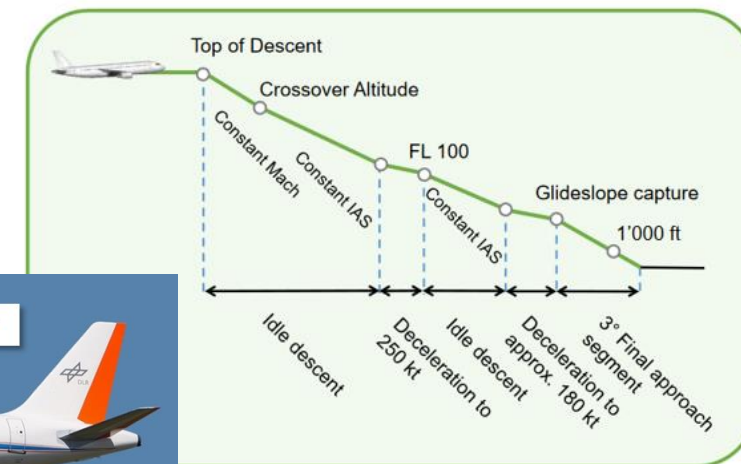
SESAR 2020 SHOWCASE

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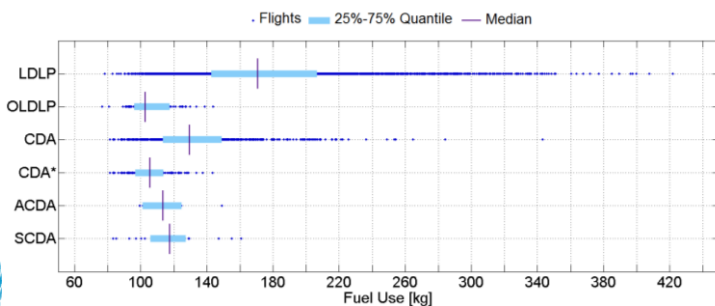
The challenge of aircraft energy management

- descent and landing approach: *reduce* potential and kinetic *energy* from cruise (high and fast) to touchdown (low and slow)
- *configure* flaps and landing gear
- the theory: Continuous Descent Operation (CDO) in idle from top of descent to stabilisation altitude (typically 1000 ft above threshold)
- the practice: wide variation of fuel consumption and noise for nominally identical transitions

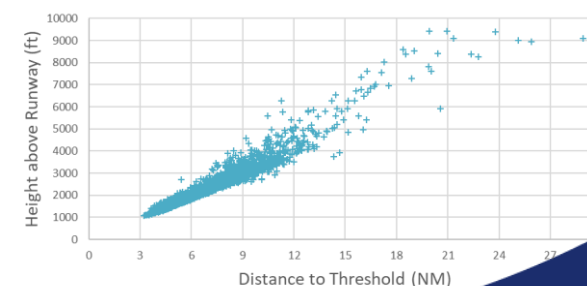
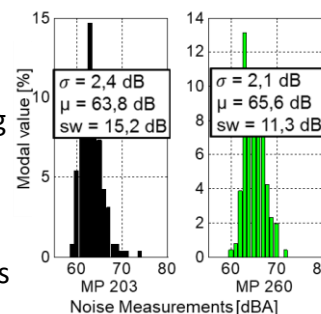


what are the reasons for these differences?

example:
fuel use for
different approach
types



example:
noise
monitoring
data for
nominally
identical
trajectories



example:
height/airspeed
of landing gear
extension



Controlling the aircraft during approach and landing

- the theory: *managed* flight following published transition
- the practice: *vectoring* by ATC; limited knowledge of wind and weather
- pilots' tasks:
 - execution of ATC instructions
 - energy management (potential vs. kinetic / altitude vs. airspeed)
 - configuration management (flaps, landing gears)

→ pilots and autopilot control the aircraft together



- ✓ Flight Control Unit
- ✓ Speed brakes lever



credit: DLR/Mast

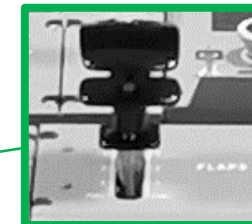


- ✓ Landing gears lever

- ✓ Engine switch and throttle



- ✓ Flaps lever

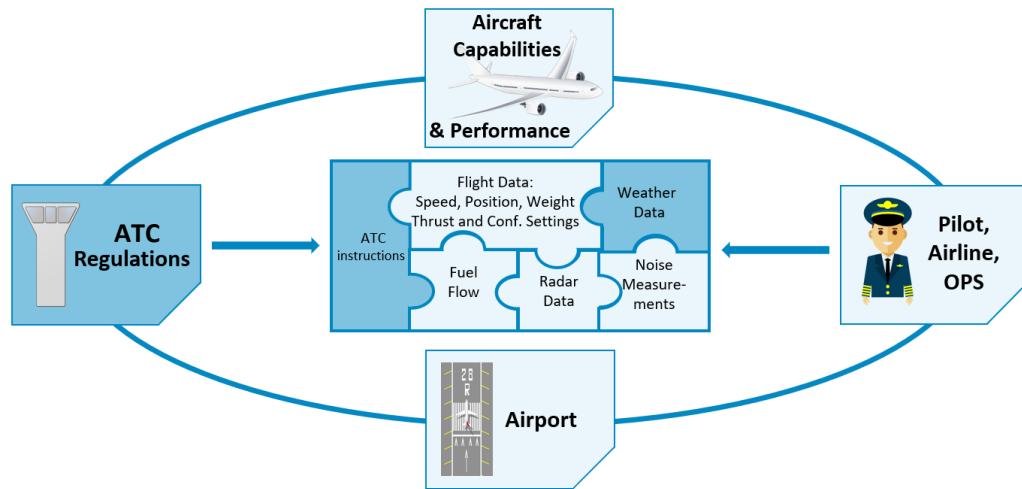


credits:
THALES AVS



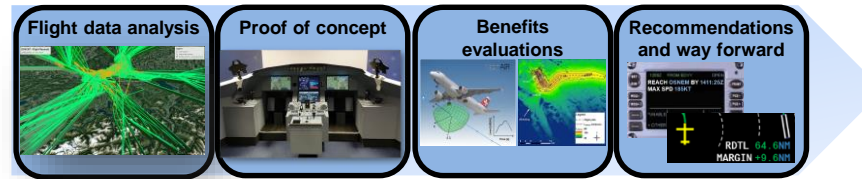
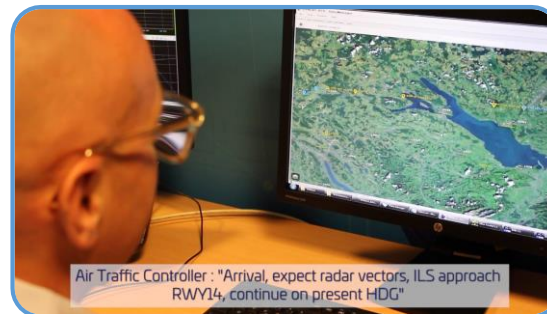
DYNCAT project approach

- critical analysis of current operations data, exemplarily LSZH (ZRH) runway 14, A320-214

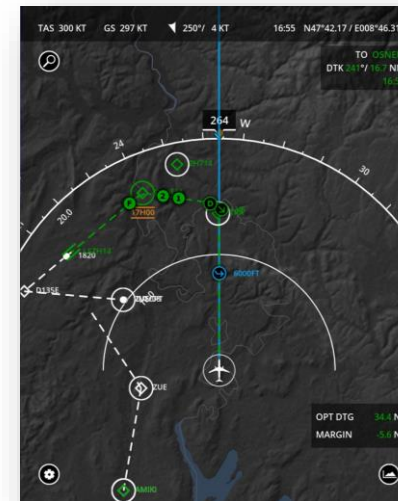


- experimental evaluation of selected components

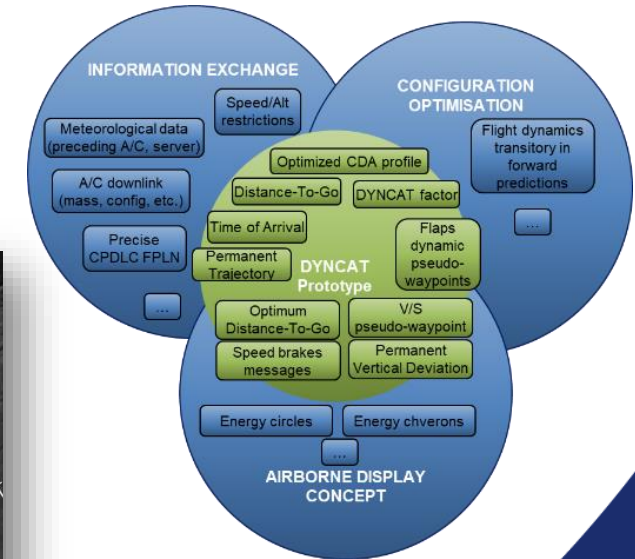
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- development of operational concept
 - integrated solution for ground and airborne sides
 - improved communication and data exchange
 - continuous optimisation of a/c configuration and speed schedule by FMS
 - improved a/c display concept

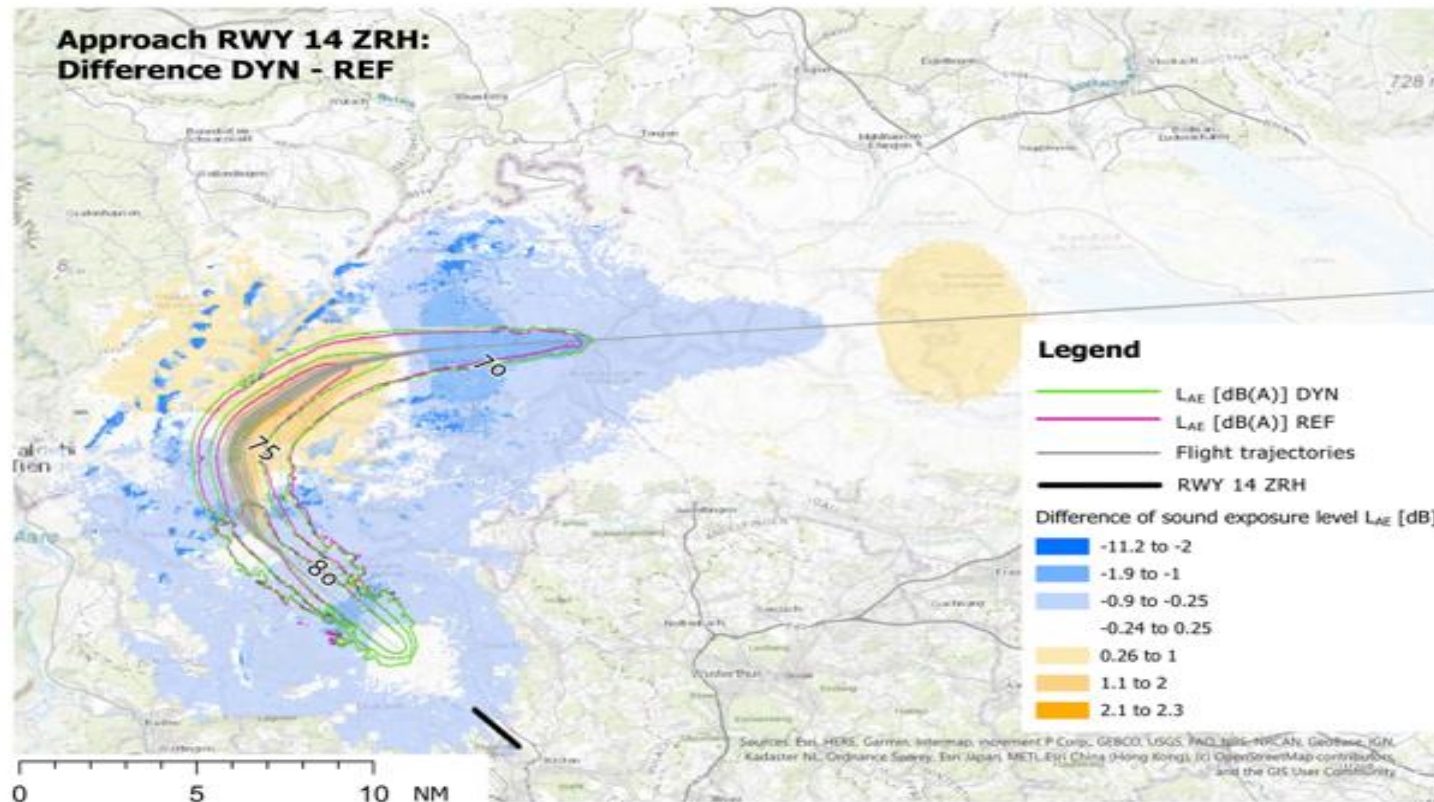


- way forward

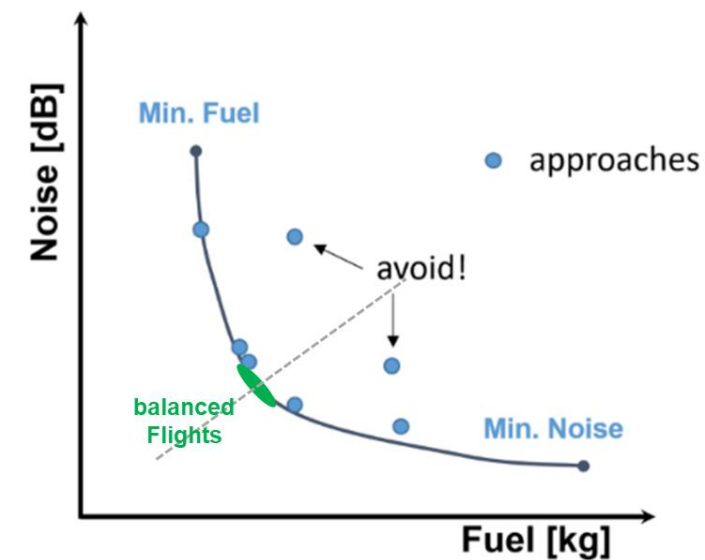


Quantified benefits of DYNCAT FMS function

- fuel use & noise reduction



- better stabilisation
- increased situational awareness
- higher predictability of trajectory (in 4D)



- optimal trade-off

watch the video at: https://youtu.be/XBI_S1L4R8c



Thank you

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all deliverables available at
<https://www.dyncat.eu/>



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