



Flight Centric ATC Capacity Management

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DLR

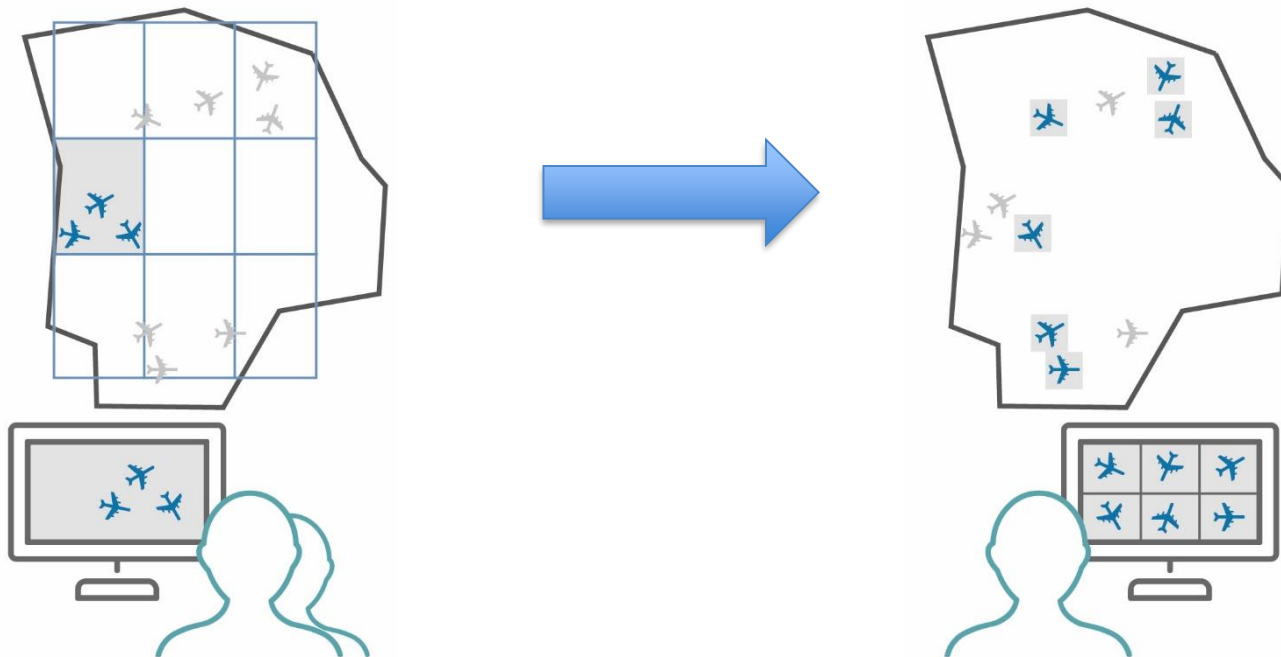
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Founding Members



Flight Centric ATC



Main Goal



Even Distribution of Workload

ATCO Productivity



Capacity Management in FCA Use Cases



Planning of
of CWP

1-2 weeks

Opening and Closure
of CWP

Allocation of Traffic
entering the FCA

<1 hour

COTTON Results

Allocation



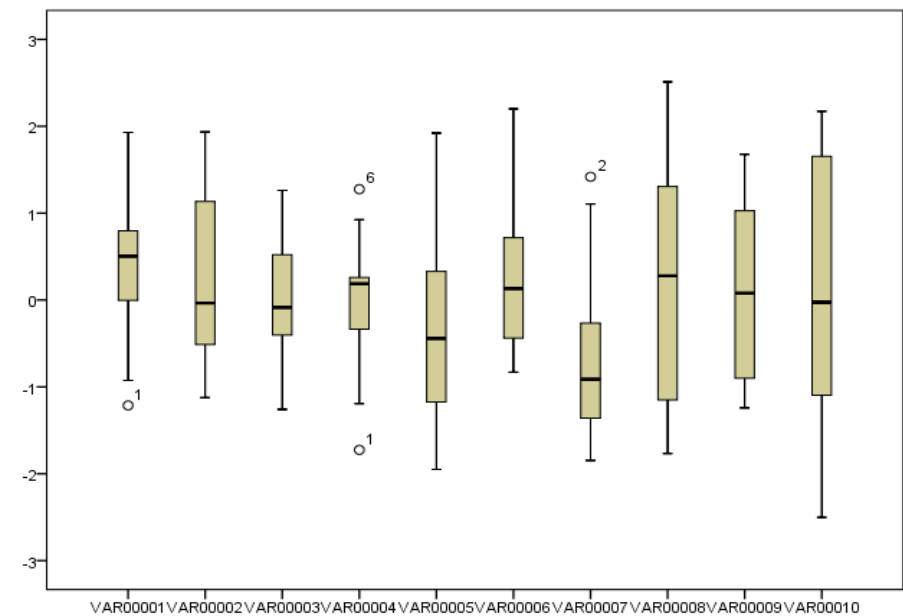
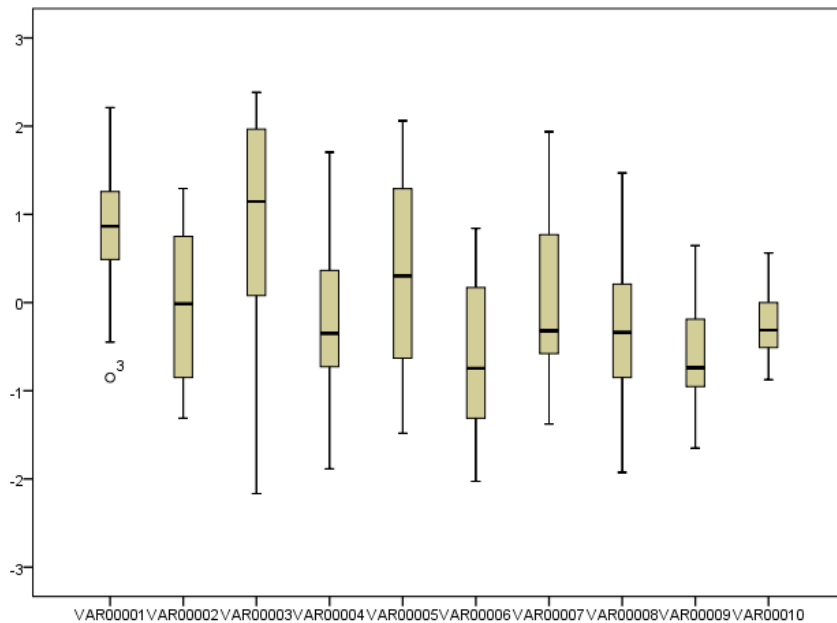
Baseline:

Complexity Metric from PJ.10-01b

- Number of A/C
- Penalty Factor for Evolving Flight
- Penalty Factor for Interactions

COTTON Solution:

Geometric Approach

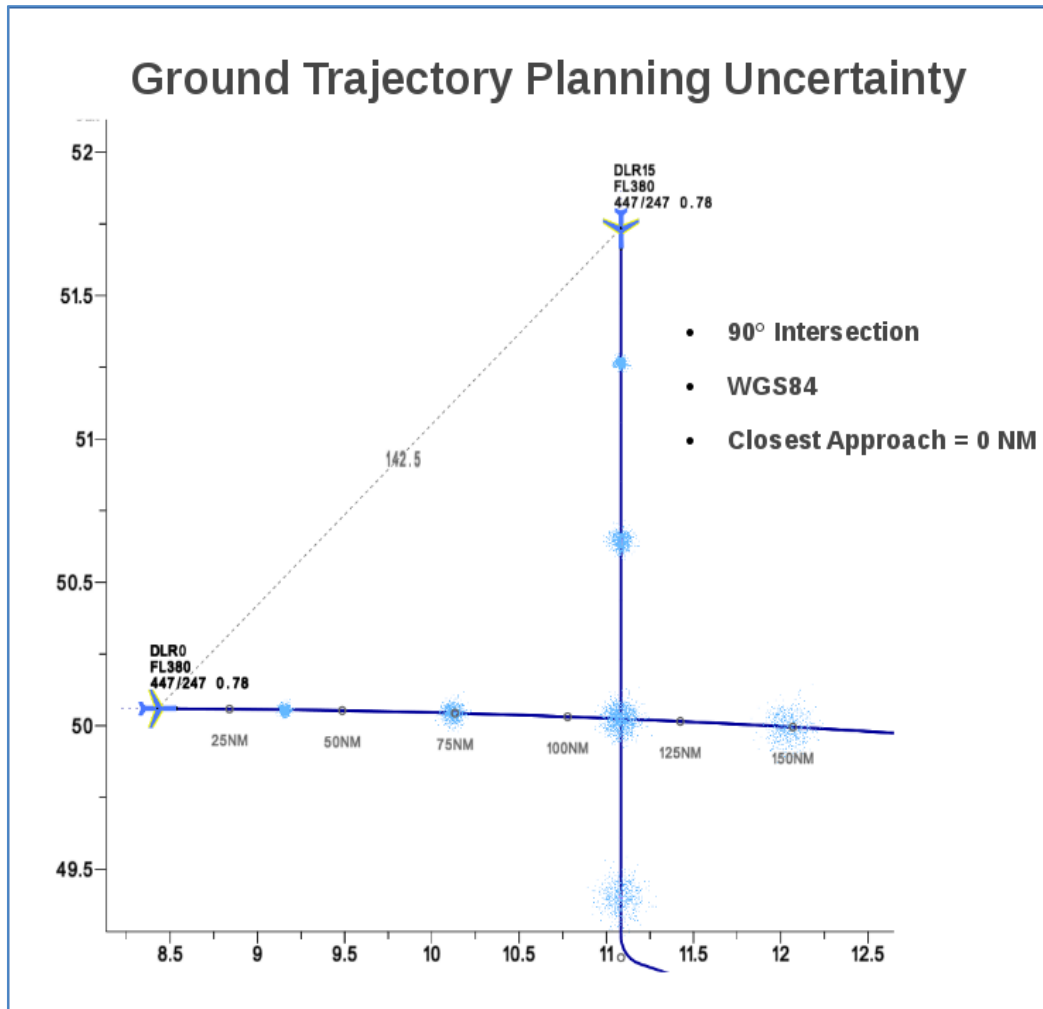


VAR 0.259

VAR 0.094

COTTON Results

Uncertainty



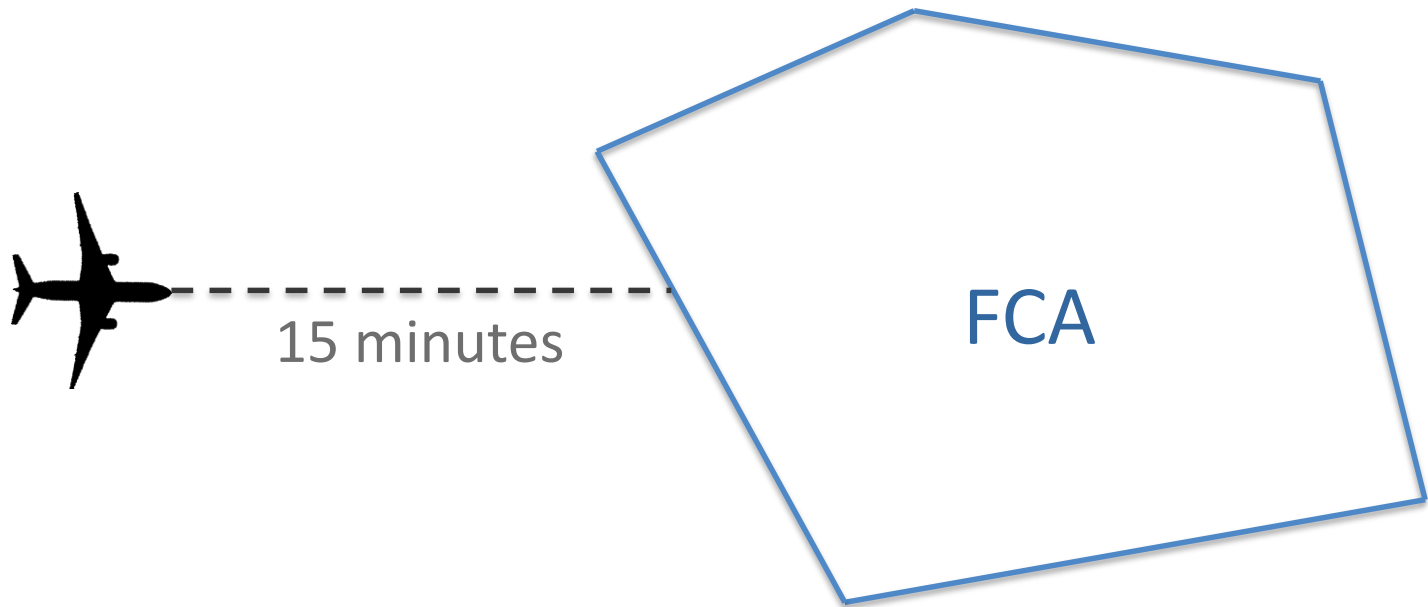
Short-term Flight Allocation:

- No impact in case of Geometric Approach

Opening / Closure of CWP:

- No impact on closure
- Position error well within time margins for opening

Short-term Traffic Allocation based on Geometric Approach



Influencing factors:

- (Number of aircraft under control)
- Proximity and Closure Rate (3D) to other traffic in FCA
- Penalty factors for climbing and descending aircraft

Complexity in FCA

Open Question: Team Composition



1 PC	1 EC	
1 PC	n EC	
m PC	n EC	$m/n = \text{const.}$
x PC	y EC	x, y independent
EC/PC		(SPO)

Complexity Threshold EC?
Complexity Threshold PC? in FCA?

Complexity in FCA

Open Question: Coordination

- Automatic Responsibility Allocation
 - Less Impacted Flight Rule
- Electronic Coordination
 - e.g. Sharing of Probing
- Re-Allocation of Traffic
 - Transfer workload?
 - => Geographic Allocation?
- Automatic Resolution Advisories

Complexity in FCA

Open Question: CD&R Tools

- Conflict Detection Tools mandatory?
 - Which Time horizon(s)?
- Conflict Resolution Tools
 - What-if
 - What-else
 - Resolution Advisories

Complexity in FCA

Open Question: External Factors



Thunderstorms

Diversions (coordinated)

Military



FCA Complexity & DCB

Thank you very much
for your attention!



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EUROPEAN UNION



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