COTTON
Capacity management: Optimization for Trajectory Based Operations

COTTON Objectives:
- Development of a complexity metric score suitable to Dynamic Airspace Configuration (DAC) and Flight Centric ITC (FCA) modes of operations.
- Optimized capacity management by incorporating Trajectory Uncertainty into their demand and capacity balancing (DCB) tools.
- Explorative integration of DAC and FCA solutions and the operational requirements for their common implementation.

COTTON Enhanced Complexity Metrics

- Solution space
- Cognitive
- Geometric
- Aircraft
- Workload

COTTON Enhanced Capacity Management Use Cases (UCs)

- Integration with DAC/FLC zones
- Simulation workflow
- Load balancing based on percentiles of the predicted probabilistic complexity
- DAC/FLC boundary delineation with the support of COTTON enhanced complexity defined with sufficient level of detail to demonstrate technical and operational feasibility and demonstrated reduction of overload.

COTTON Validations

- FCA in the Short-term
  Impact of trajectory uncertainty in FCA short-term planning phase, using Geometrical Complexity (UCs 4 and 5).

- DAC in the Short-term
  Optimisation of airspace configuration process in the short-term, using Cognitive Complexity (UCs 11 and 12).

- DAC in the Medium-term
  Optimisation of airspace configuration process in the medium-term, using Geometrical Complexity (UCs 13, 14, 15, 16, 17, 18, 19).

- Integrated DAC/FLC
  Complexity-based sector configuration

Validation Results

- FCA
  Allocation strategies based on COTTON Enhanced Complexity have showed better balance of ATC workload.

- DAC
  DAC shows that the application of complexity metrics better adapt to trajectory-based environmental allowances sector configuration plan more adaptability to traffic demand, reducing the risk of imbalance.

- Integrated DAC/FLC
  DAC/FLC boundary delineation processes with the support of COTTON enhanced complexity is defined with sufficient level of detail to demonstrate technical and operational feasibility and demonstrated reduction of overload.

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