

BEACON – a SESAR ER4 project



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Objectives

BEACON's general goal is to explore the role of **AUs' complex behaviours, such as bounded rationality**, in the design of new management procedures.

More specifically, BEACON will:

- Propose a set of **improved flight prioritisation mechanisms** that expand current UDPP capabilities.
- Define new metrics to evaluate the **fairness and equity** of flight prioritisation mechanisms and validate them.
- Quantify the impact of **'non-rational' behaviours** of AUs on the outcome of the proposed mechanisms, using behavioural economics.
- Integrate the insights into an **agent-based microsimulation model** of the full ECAC network able to capture network effects and compute KPIs.
- Run a set of simulation experiments to evaluate the impact of the new UDPP mechanisms on the selected KPIs to analyse **the advantages and the risks with respect to the current UDPP capabilities**.
- Derive guidelines and methodological recommendations on the further **development, validation and deployment** of the new UDPP mechanisms.

5 steps:

- **Problem definition** and high-level modelling requirements
 - Definition of KPIs, mechanisms, scenarios
- **Small-scale** behavioural modelling
 - Inference of behavioural parameters through small experiments
 - Mechanisms testing.
- **Large-scale** simulations at ATM network level
 - Use of European-wide microscopic ABM Mercury.
 - Human-in-the-loop simulations.
- **Analysis** of modelling results
 - Statistical effects, differential effects
 - Computation of KPIs, non-rationality
- **Conclusions**, guidelines and recommendations
 - Importance of non-rationality, recommendations for further studies (e.g. B.E. used at the design stage)
 - Concept assessment (in particular regarding new mechanisms).