

## Cooperative air traffic structuring

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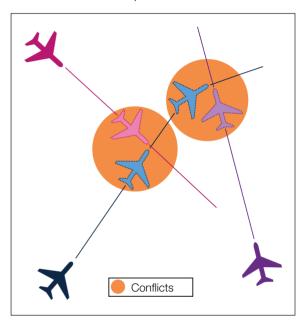
# **Cooperative Air Traffic Structuring**

## **Multi-Agent System**

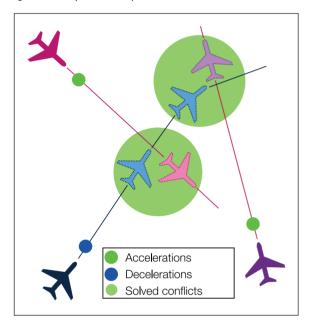
- Resilient, fast and scalable method for problem solving
- Composed of agents (aircraft) **cooperating** to elaborate their trajectories
- Decisions taken by each aircraft, based on knowledge of its local environment

### **Conflict Avoidance by Speed Regulation**

- Aircraft send messages containing their estimated trajectories
- Each aircraft selects optimal speed changes based on this **shared knowledge**
- Speeds are selected within [-6%, +3%] of its optimal speed



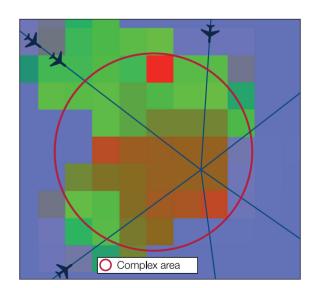
Without regulation, conflicts occur



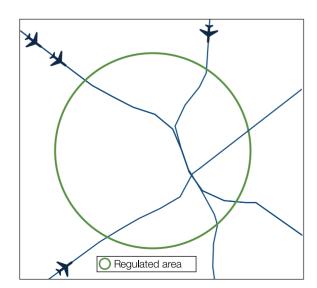
With speed regulation, conflicts are solved

### **Macro-Structuring of Air Traffic**

- The system reduces traffic complexity by structuring trajectories into flows
- The traffic complexity is monitored in real time
- The route network is **dynamically adapted** to fit the traffic complexity



**Unstructured** traffic



Structured traffic