# Short overview of the project RES 2050

## *Faster recovery after the impact of disturbances*

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Member of AT-One

PARTNER OF SESAR JOINT UNDERTAKING

# What is the Problem?

Disturbances can disrupt the state of the air traffic system

*Can the system be transferred back faster - and if so - how?*

flooded Airport LaGuardia October 2012

# Why is the project called Resilience 2050?

- Resilience is a property of ecological, socio-ecological and socio-technical systems

- **Applying resilience** on ATM

- Development of new design principles to foster resilience for ATM, **considering only physical and safety restrictions**

- Validation of the new concepts by the means of a **simplified generic model** that holistically provides **the same level of detail**

# Partners in the project

- **The Innaxis Research Institute**
- DLR
- Universidad Politécnica de Madrid
- NLR
- Istanbul Teknik Üniversitesi
- Devlet Hava Meydanlari Isletmesi Genel Müdürlügü
- King´s College London

WP 7 EU
3 years running time
Started in summer 2012

# Steps of the project, step 1

ATM as a socio-technical system

Performance based approach

- Definition of Resilience
- Description and abstraction of the interdependencies between the different stakeholders
- Description of the impact of disturbances

# Steps of the project, steps 2 & 3

## Data analysis

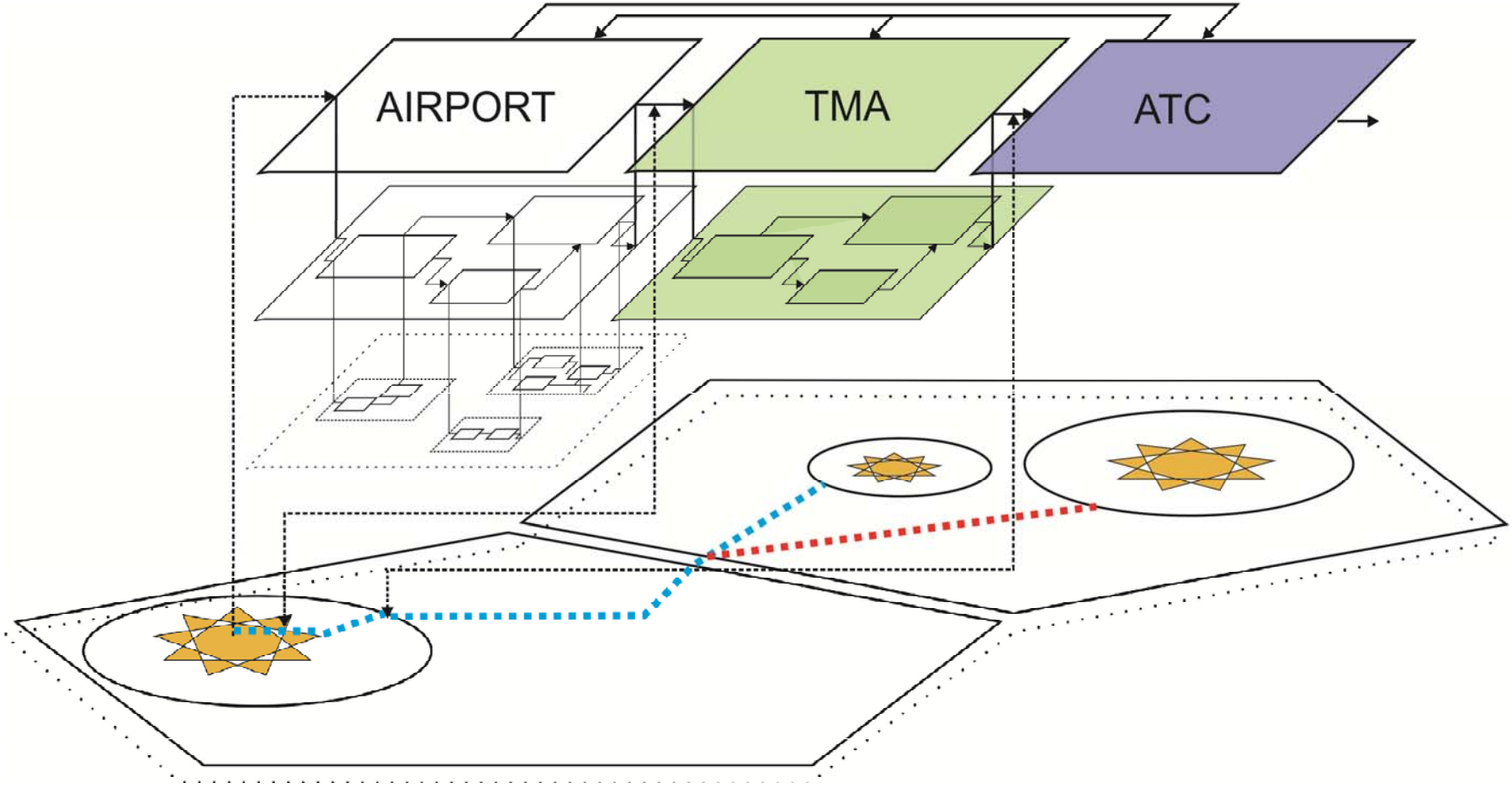
- Searching for dependencies and resilient patterns within the current ATM system

- How does the system cope with a specific type of disturbances?

## Development of new design principles which enhance resilience

- Mathematical representation of resilience by means of performance indicators

# Abstraction of the socio-technical system




# Steps of the project, step 4 & 5

## Modeling of the system

Two systems will be modelled, considering only physical and safety constraints and the same level of detail:

- *Optimal model*, highly optimized system
- *Resilient model*, incorporating resilient design principles

## Evaluating the benefit of the new design principles

On both systems two scenarios will be applied, by means of perfomance indicators the results will be examined

- *Undisturbed* and *disturbed* scenario

# In short:

A new resilient system will be evaluated

↑

simplified, generic model with the same level of detail across all areas

↑

incorporates new design principles which enhance resilience

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principles where derived from the pattern revealed through data analysis

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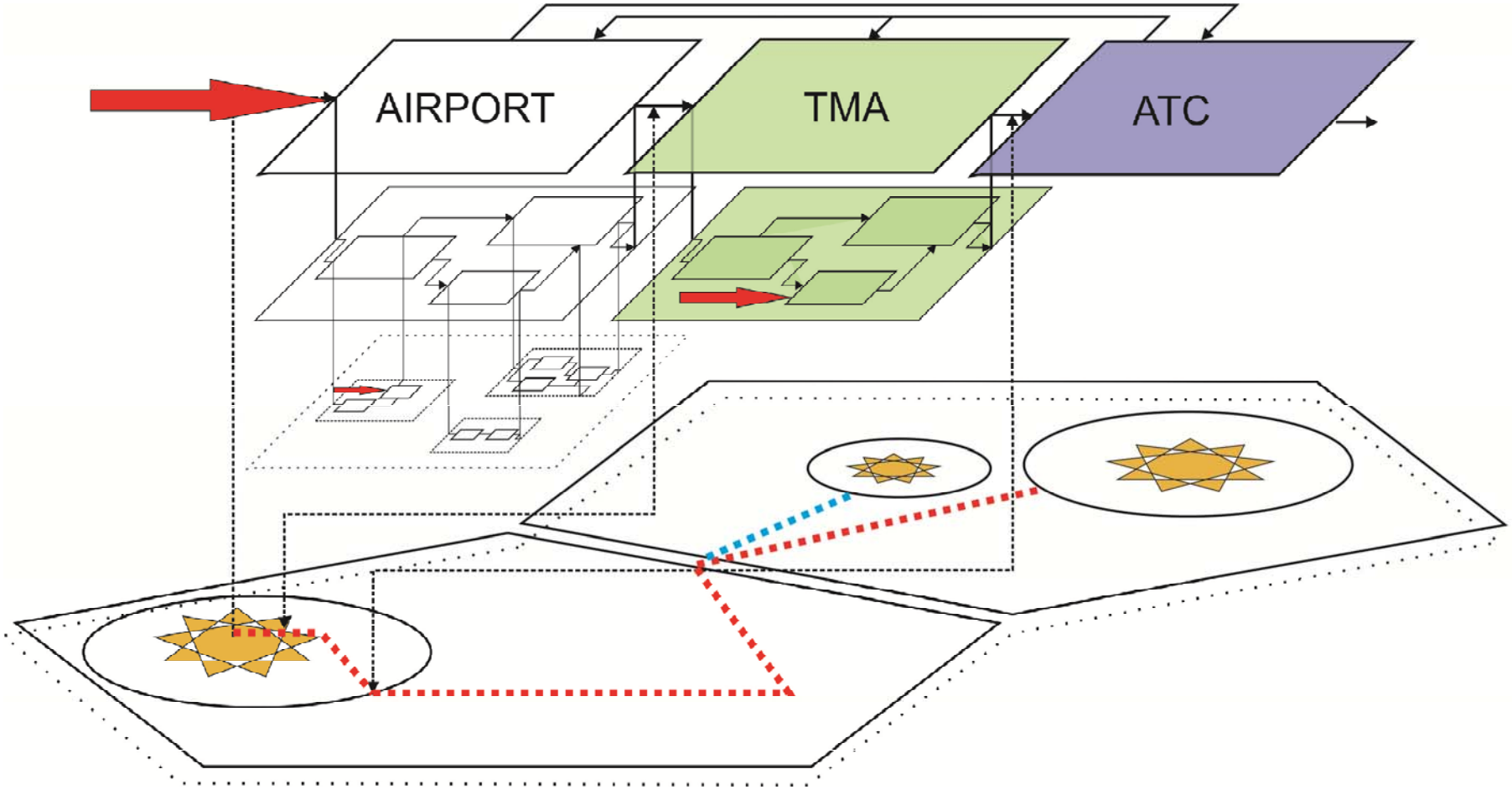
ATM system was abstracted, resilience was defined

# Current work – structured approach




# Let´s move on to

- *explain what does resilience actually mean in the context of ATM?*
- *and how to approach the investigation of the impact of disturbances?*