

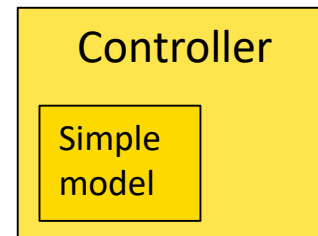
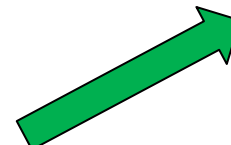
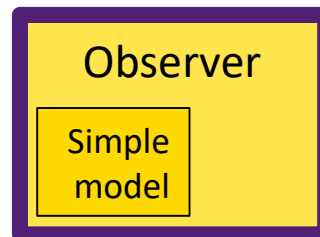
APPLICATIONS

*Estimate and predict unsteady aerodynamism and aeroelasticity
-- in real-time -- for better active control loops*

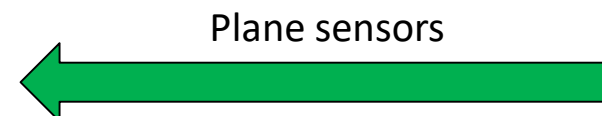
- active flutter suppression
- Passengers comfort
- Drag reduction

Estimation and prediction:

- Flow
- Lift, drag
- ...

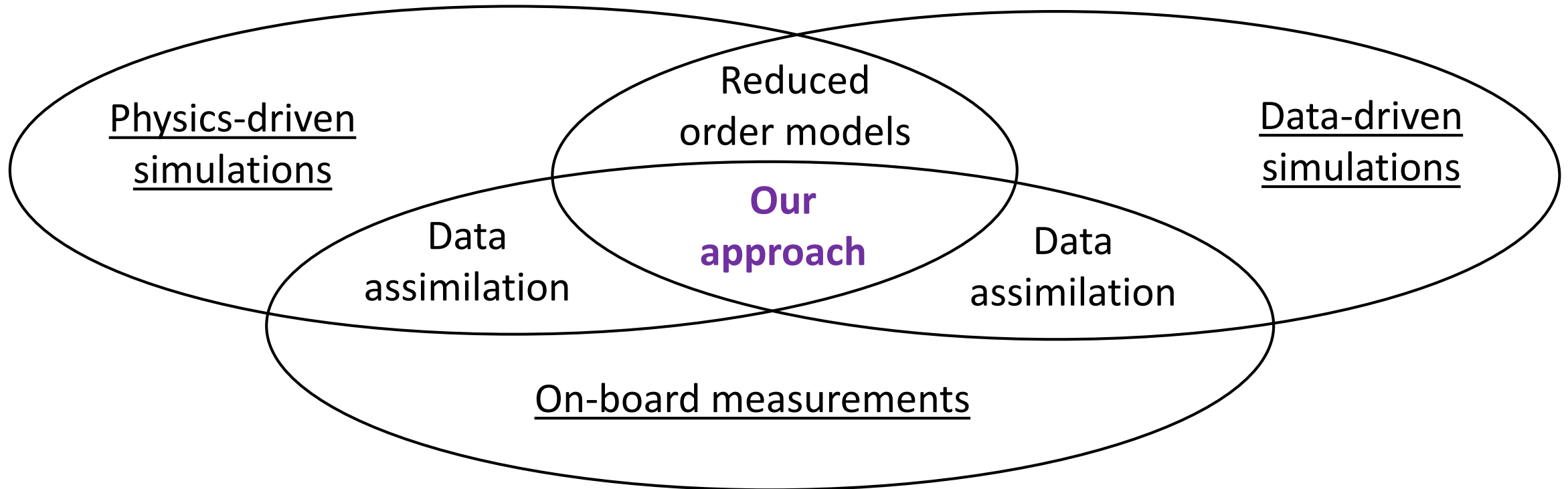


- Flaps, slats
- Fluidic actuators
- ...



Which simple model?
How to combine model & measurements?

A NEW METHODOLOGY



NUMERICAL RESULTS : 3D WAKE AT REYNOLDS 300

Reduced order models with 8 degrees of freedom
 ➤ only 1 PIV spatial point (local, blurred and noisy measure)
 is assimilated 10 times by vortex shedding cycle

Reference :

PCA-projection of the
 “true” simulation (DNS)
 (Optimal from 8-dof
 linear decomposition)

Our method :

POD-Galerkin with Navier-
 Stokes
 under location
 uncertainty (LUM)

Benchmark :

POD-Galerkin with Navier-
 Stokes + optimally
 tuned eddy viscosity &
 additive noise

