

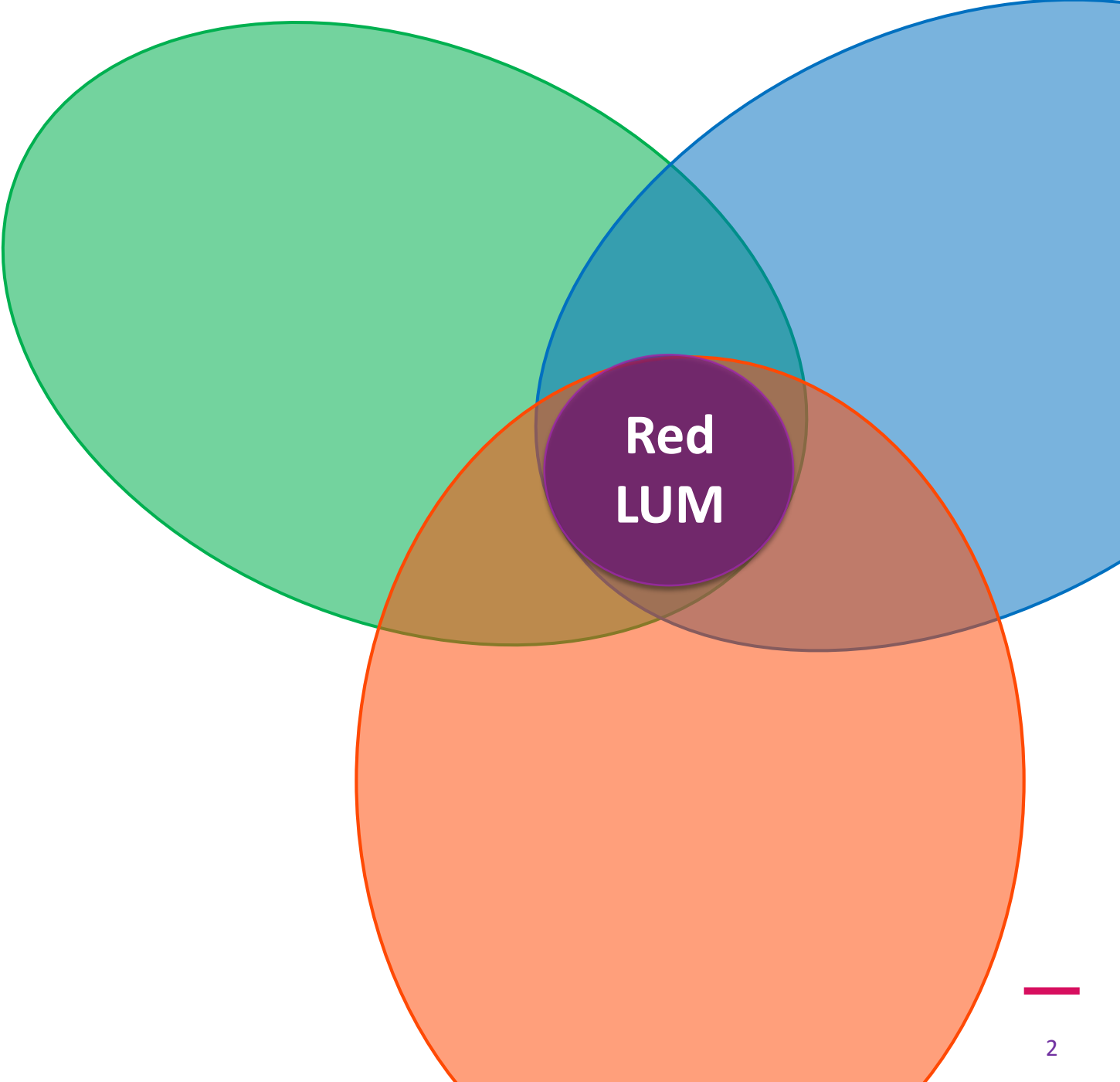
FLUID FLOW DATA ASSIMILATION FROM REDUCED ORDER MODELS AND SPARSE MEASUREMENTS

RAMSES Dec. 2021

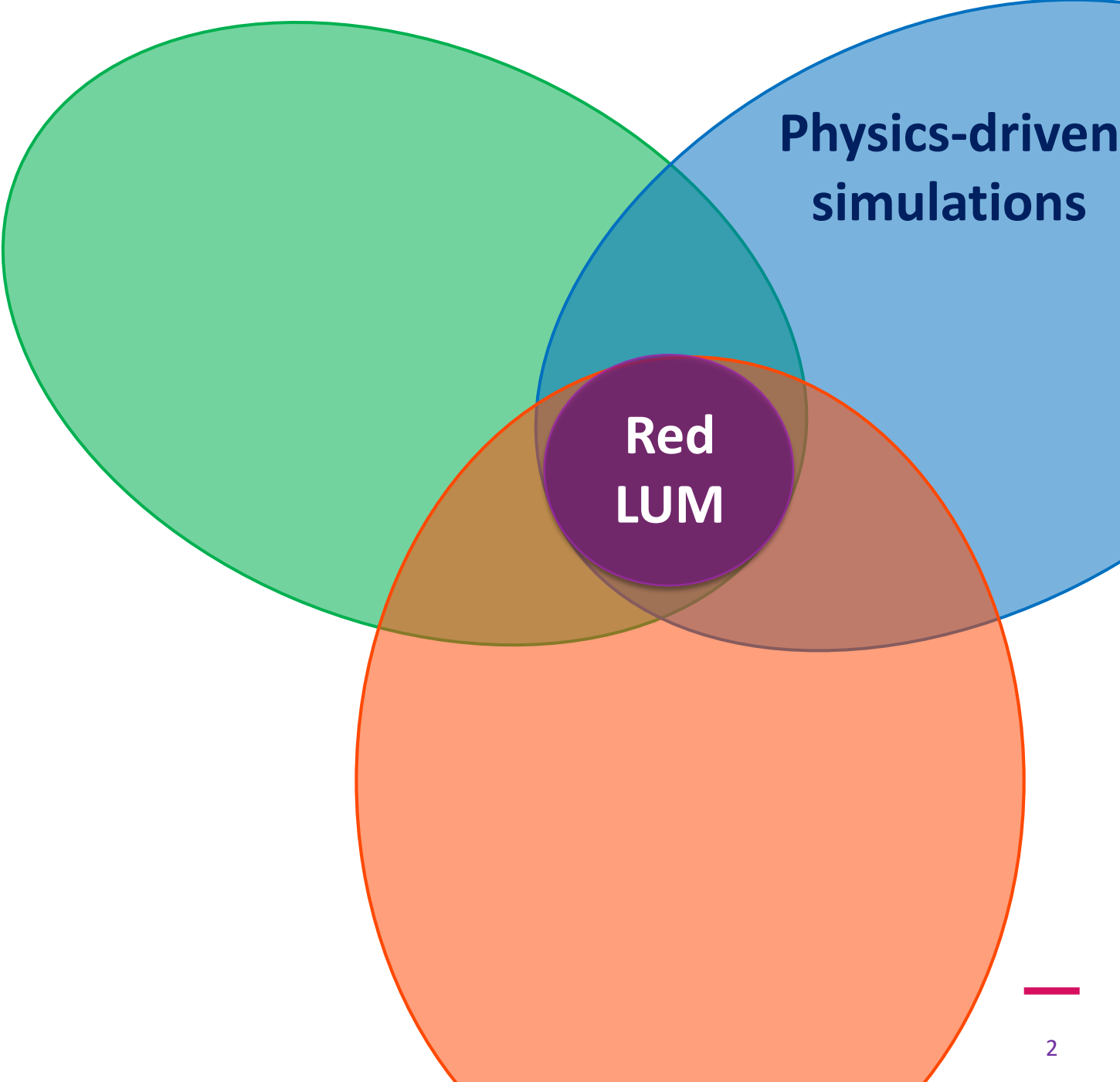
- ▶ JACQUET Pierre
@ : pierre.jacquet@scalian.com
- ▶ LE PAPE Guillaume
- ▶ MONEYRON Antoine
- ▶ RESSEGUIER Valentin
@ : valentin.resseguier@scalian.com
- ▶ STABILE Giovanni
- ▶ BESSARD Laurent



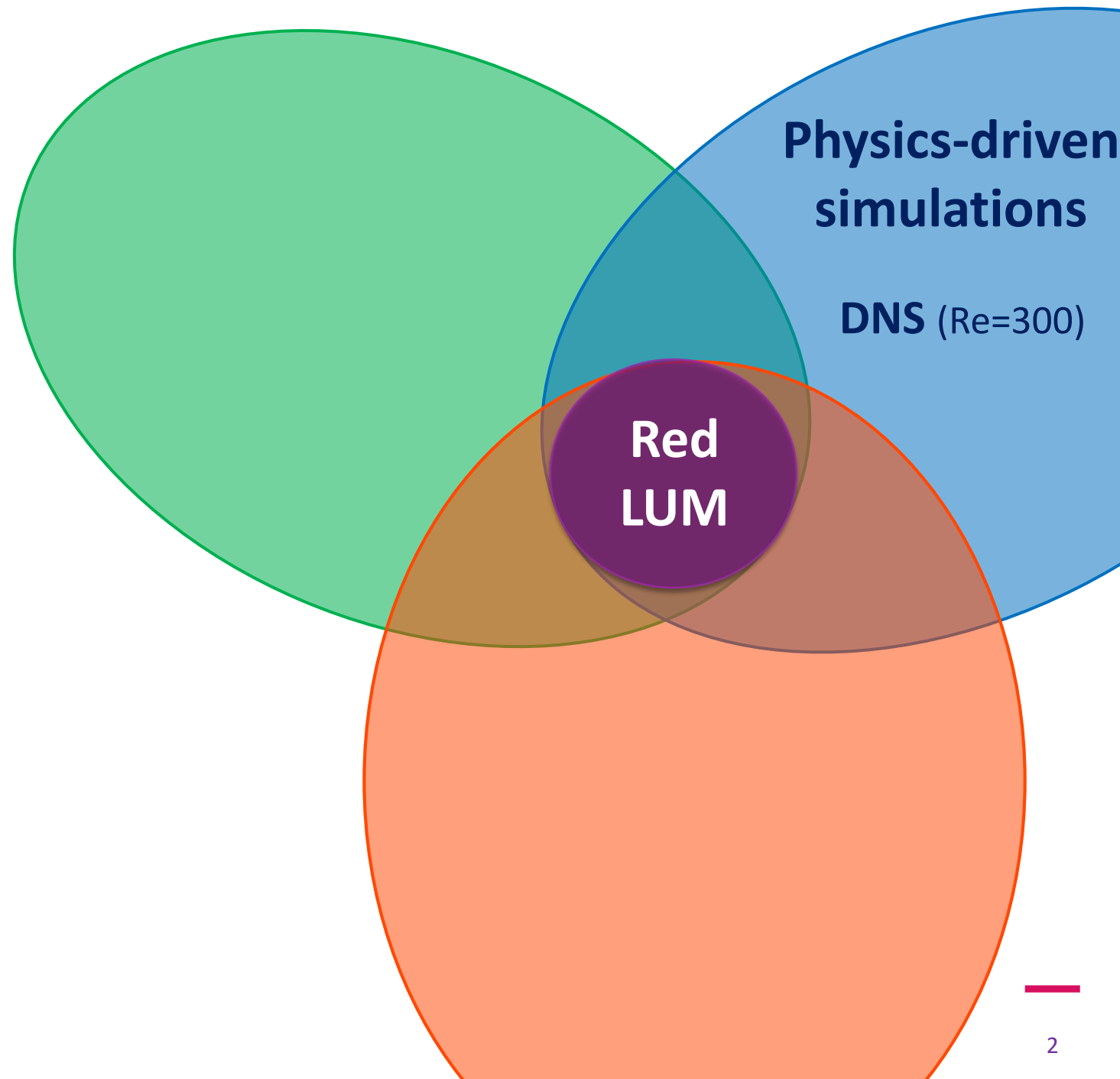
REDLUM - PROJECT



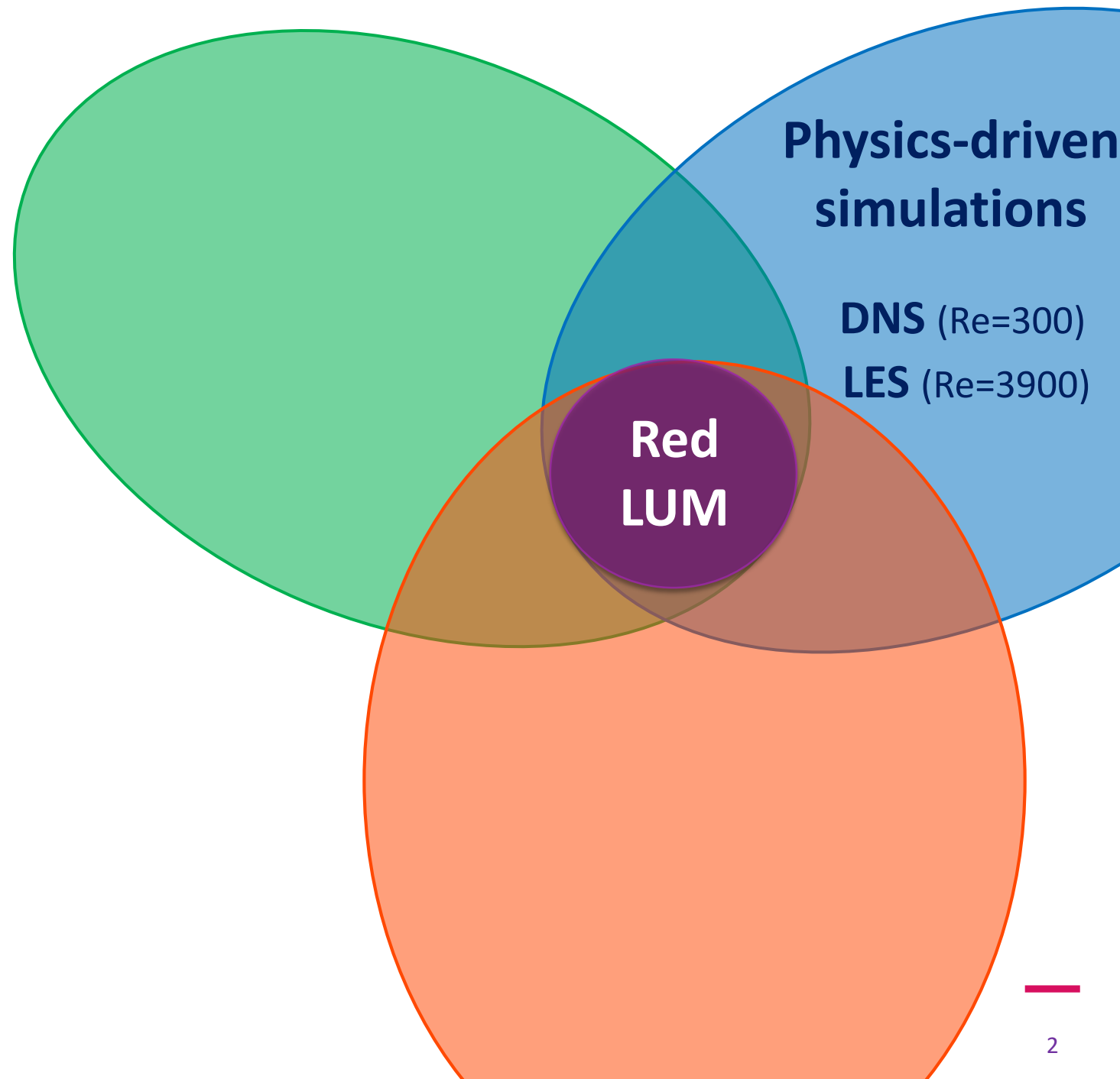
REDLUM - PROJECT



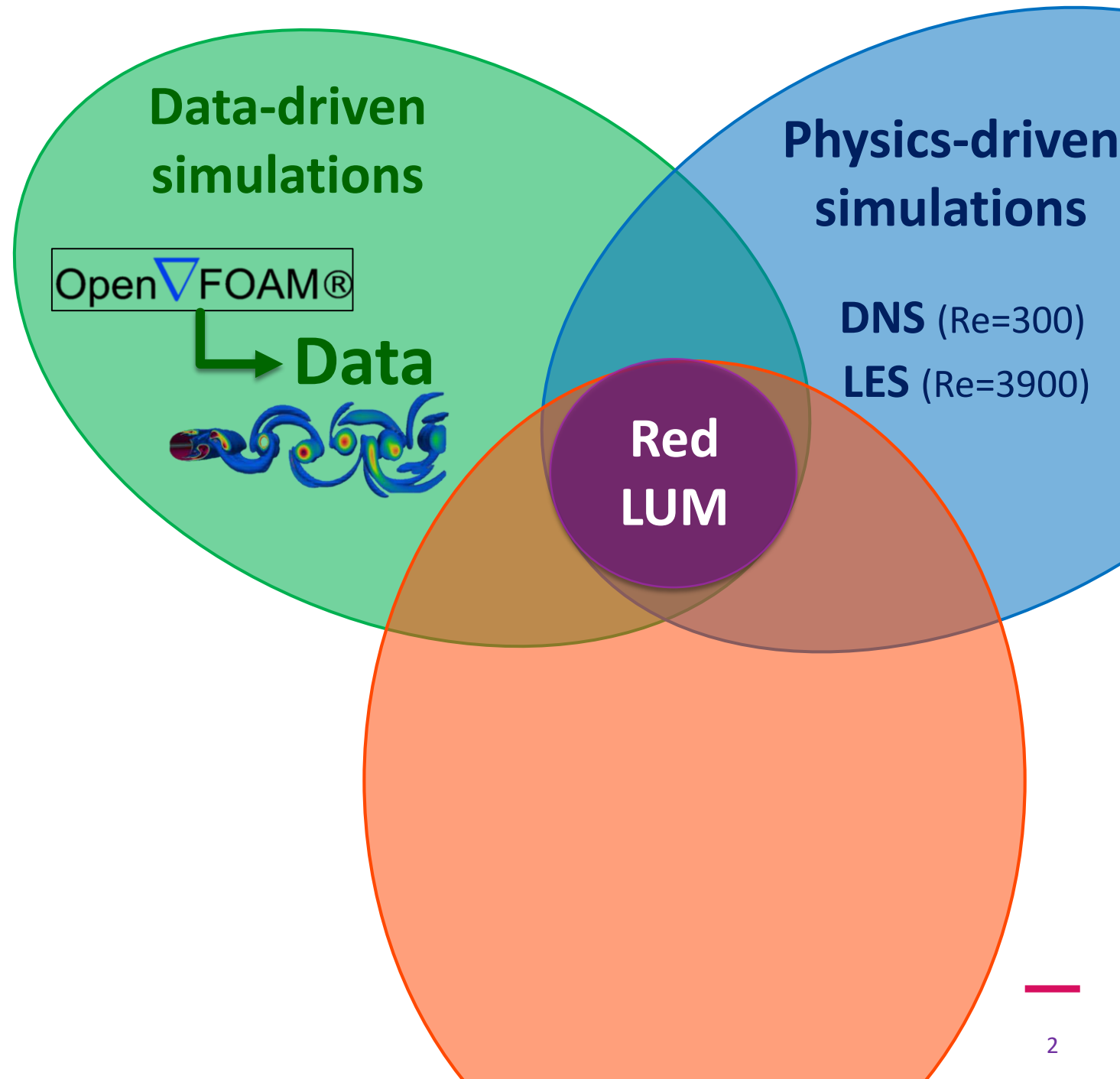
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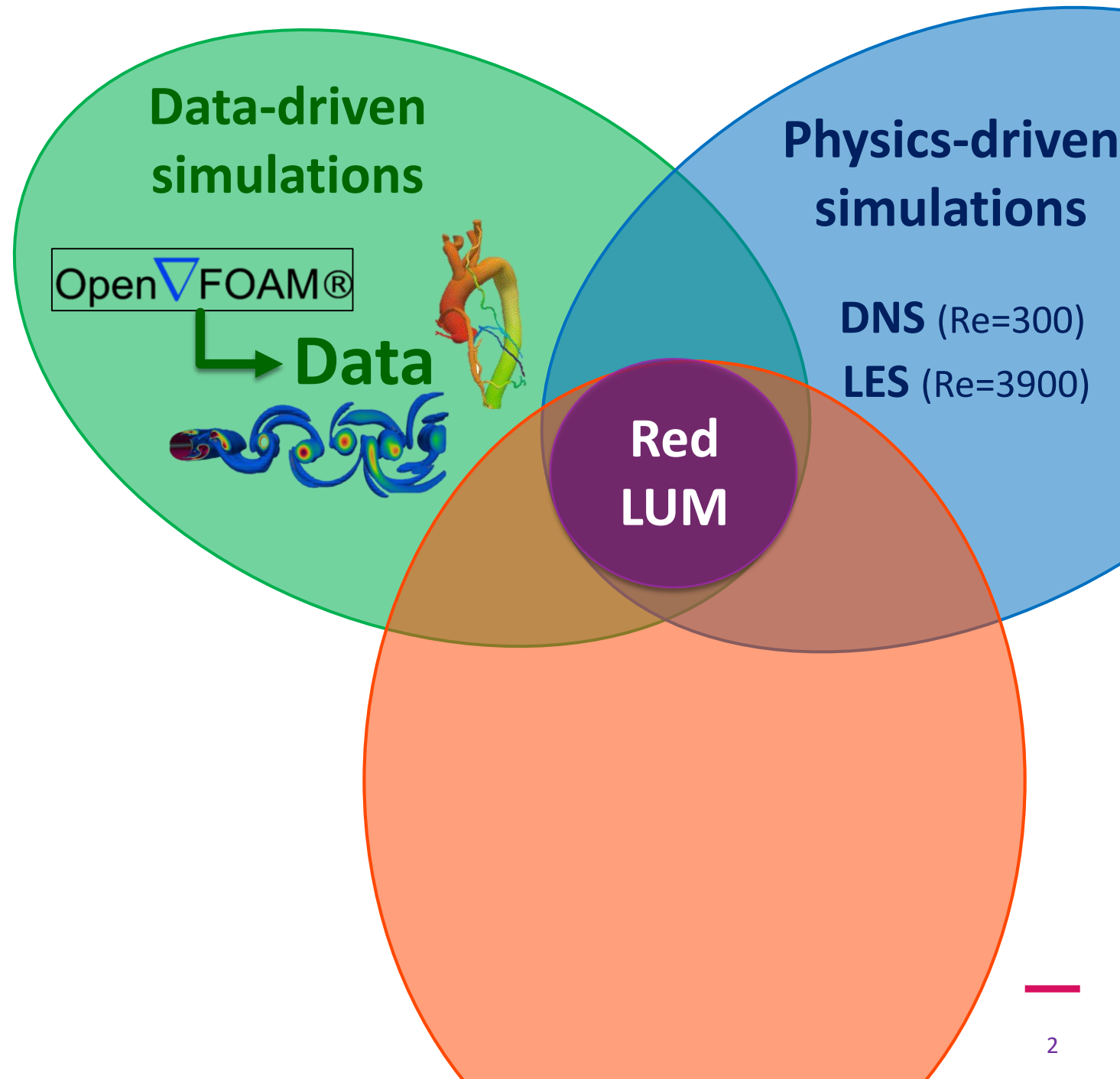
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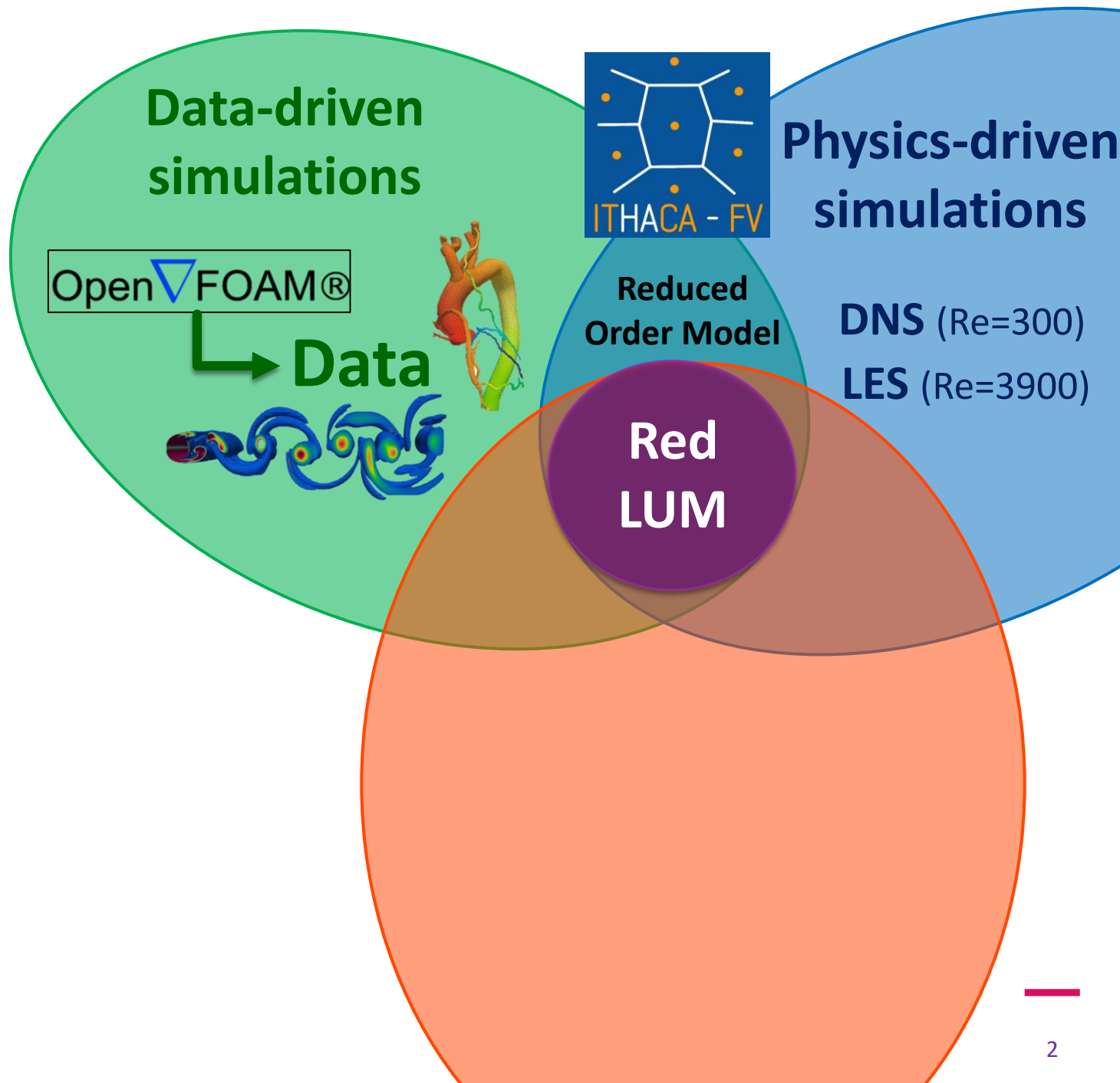
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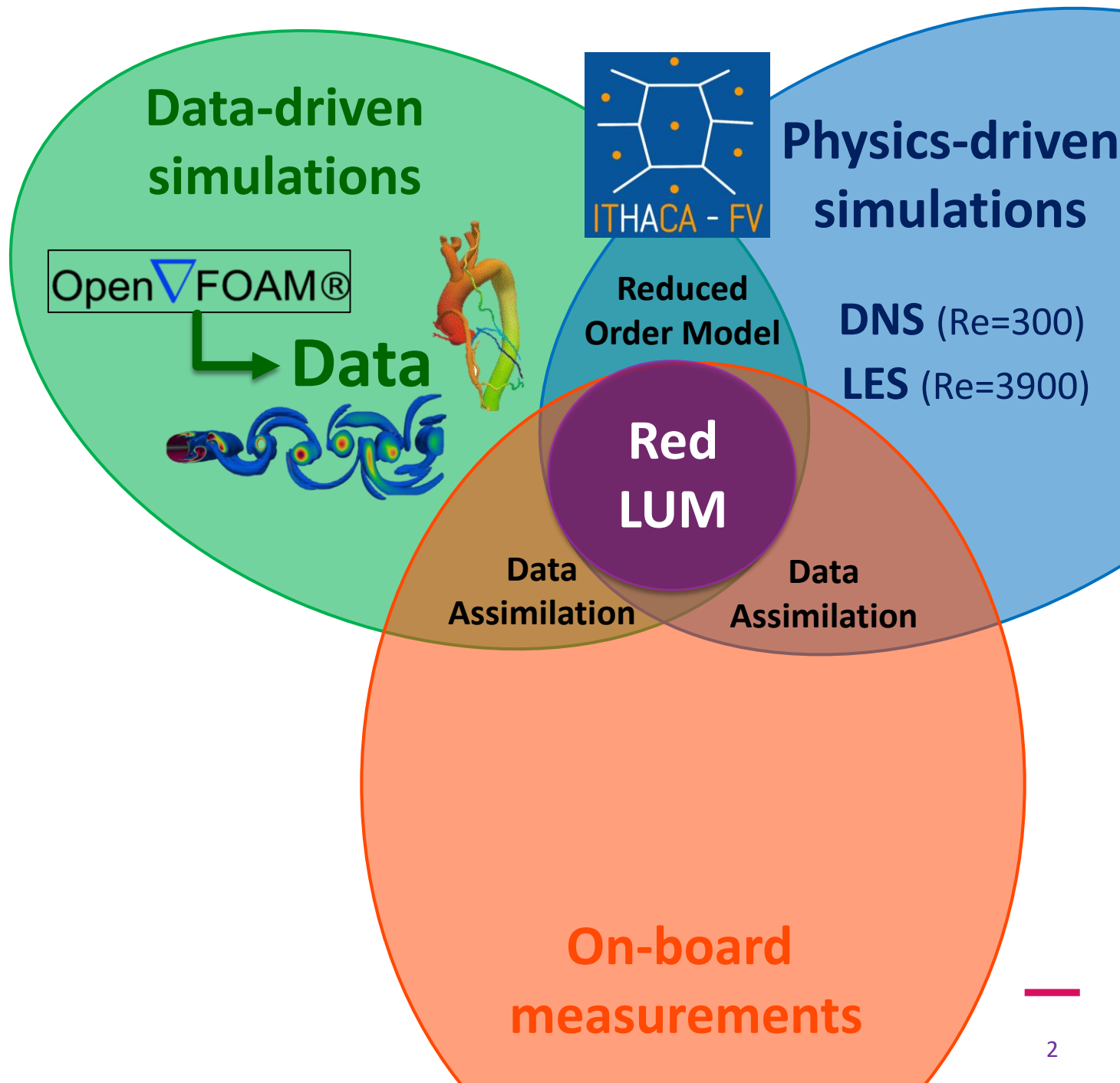
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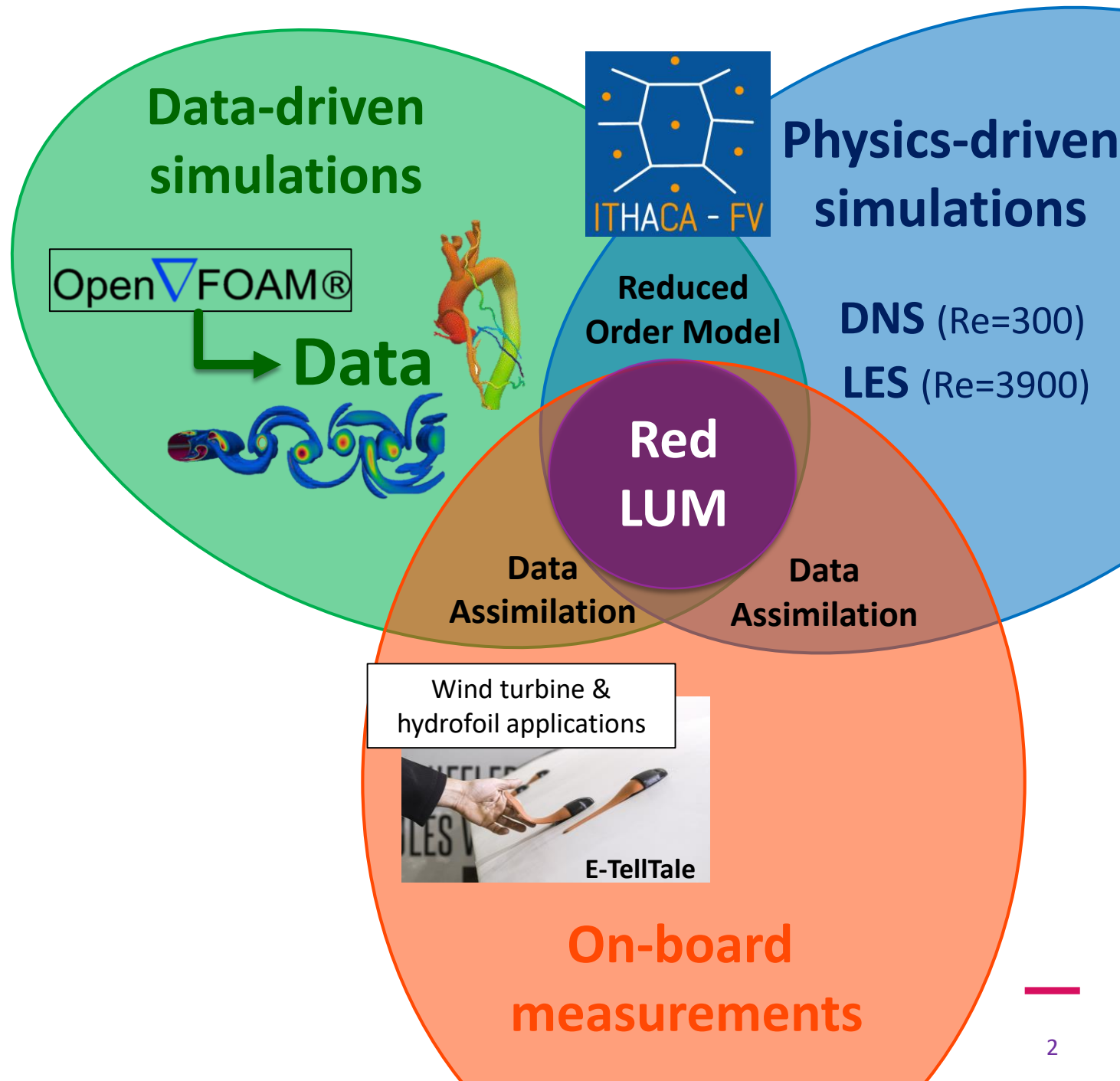
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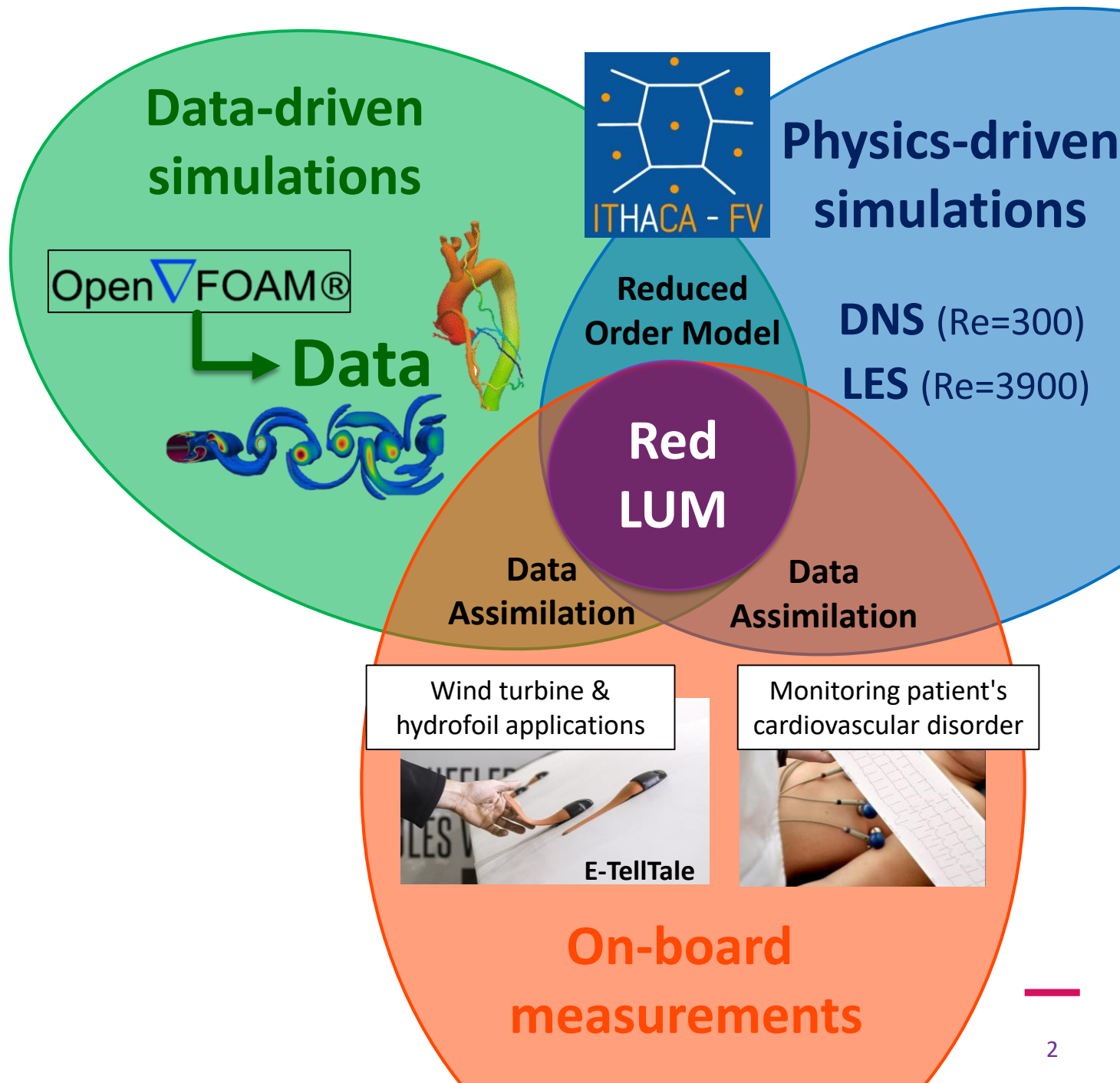
REDLUM - PROJECT



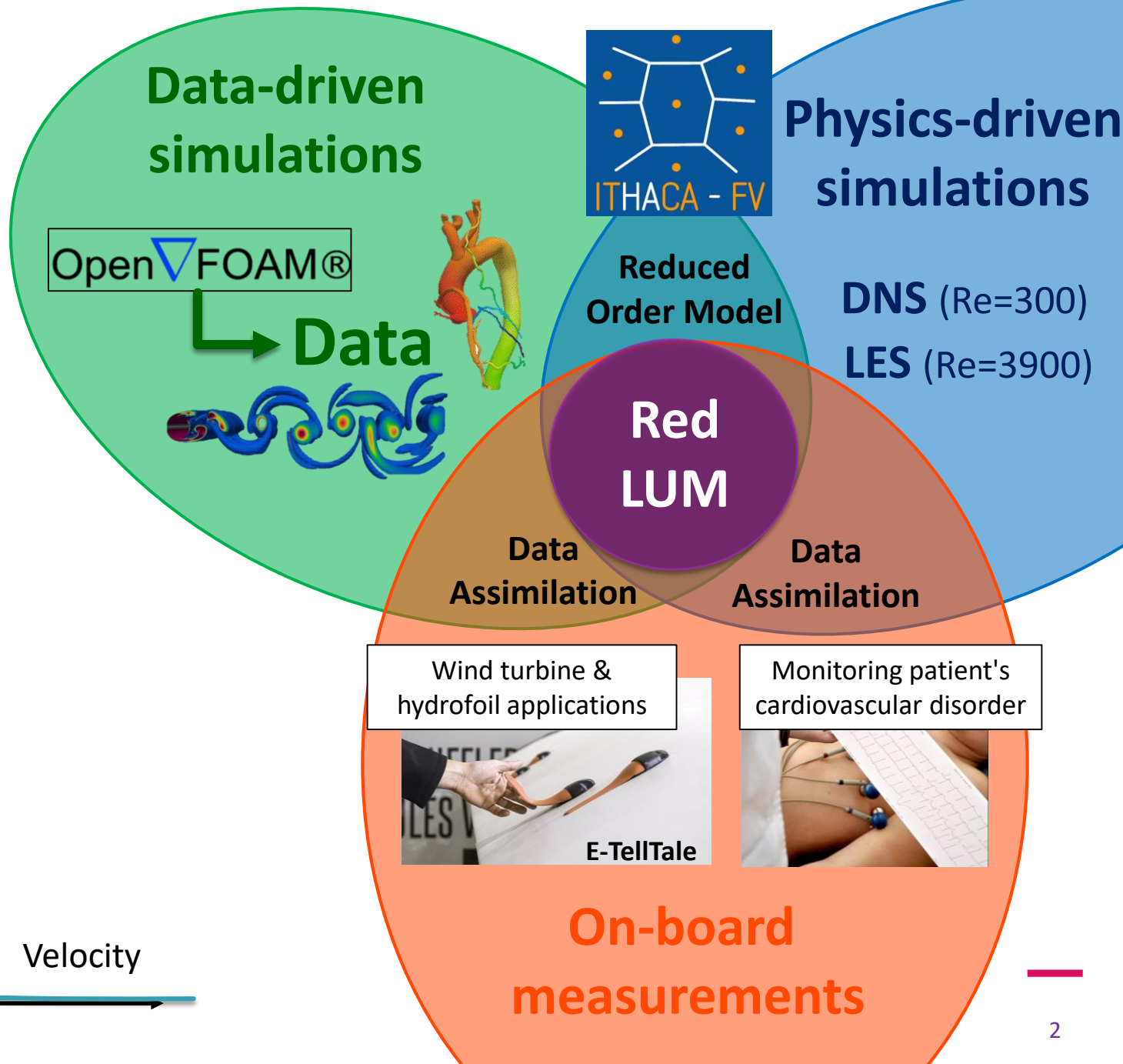
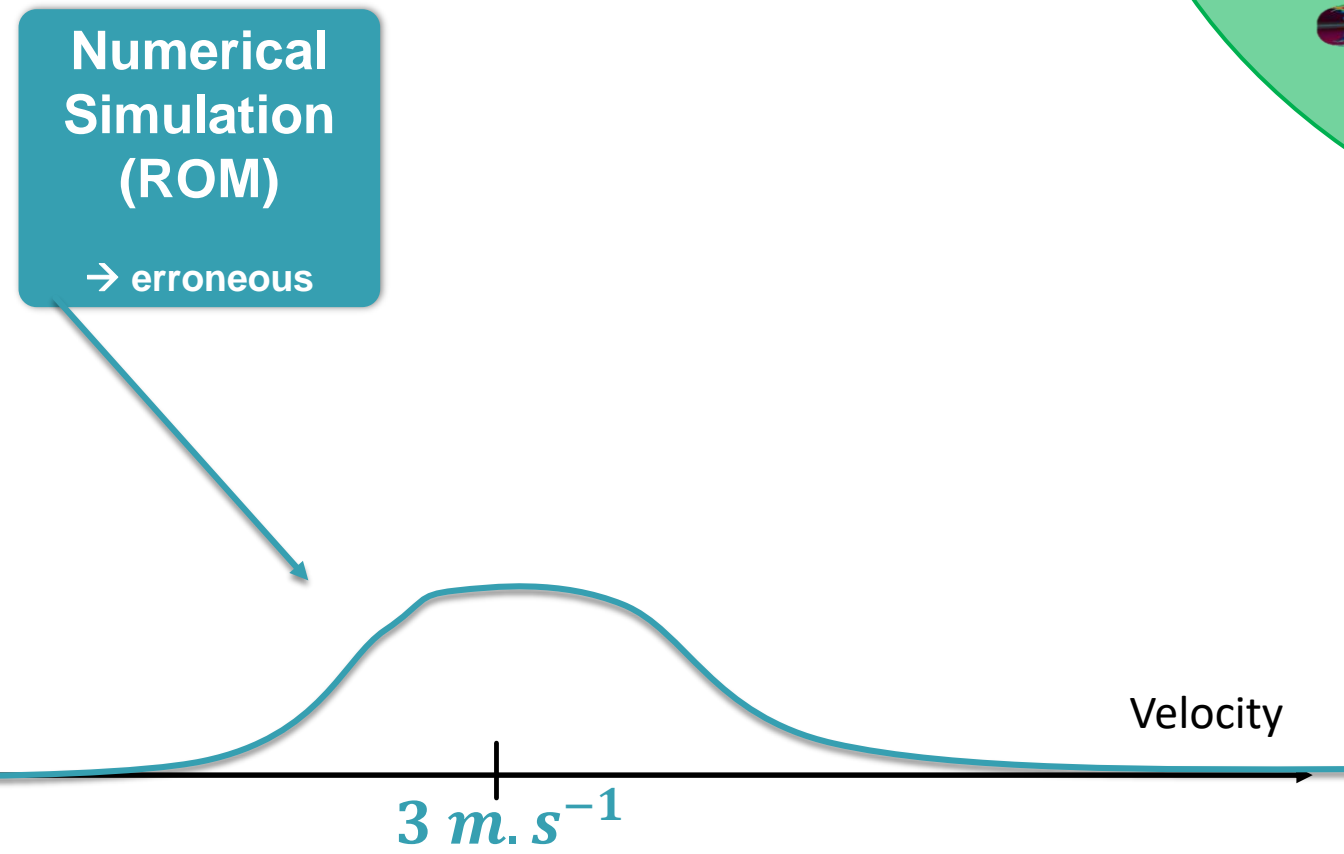
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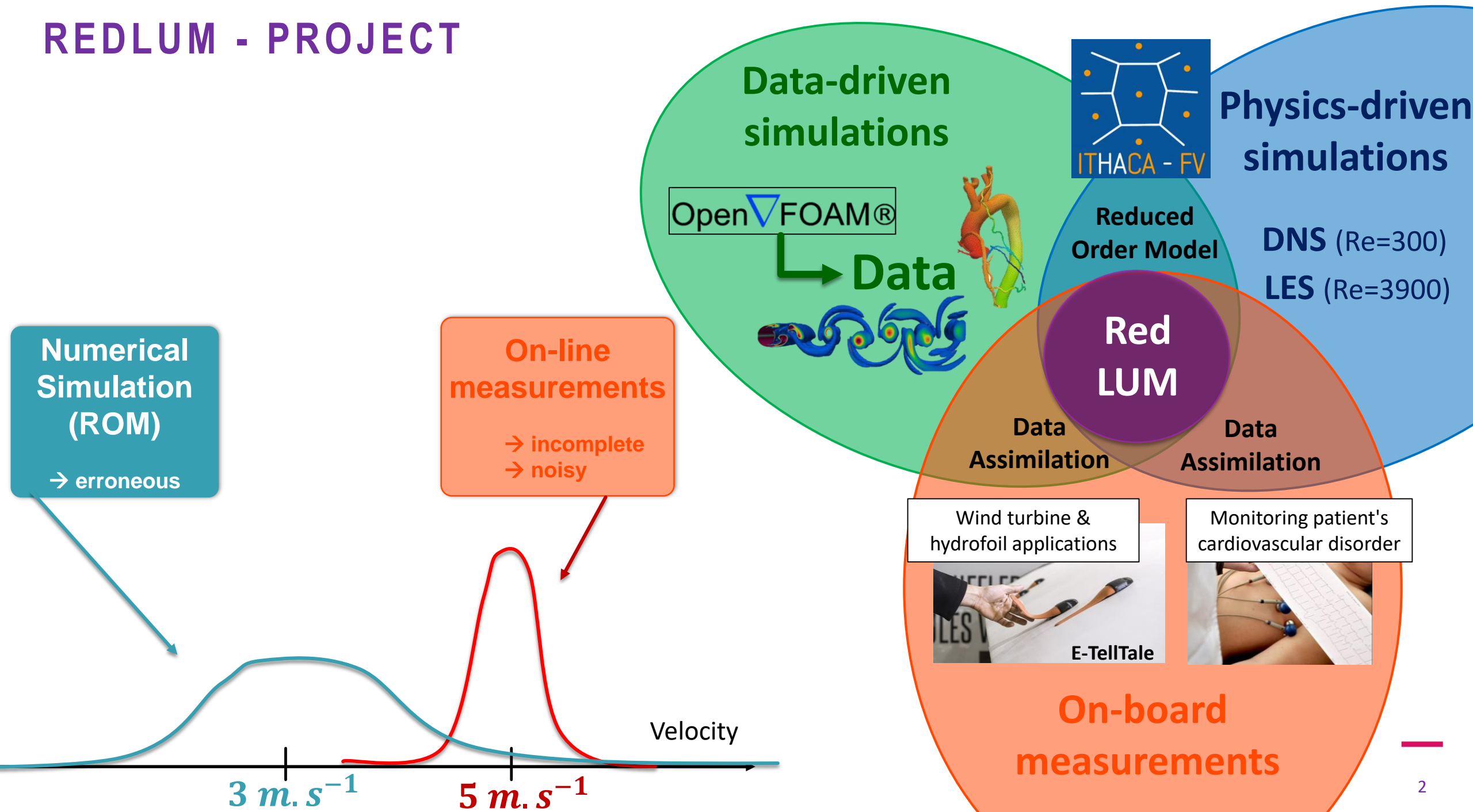
REDLUM - PROJECT



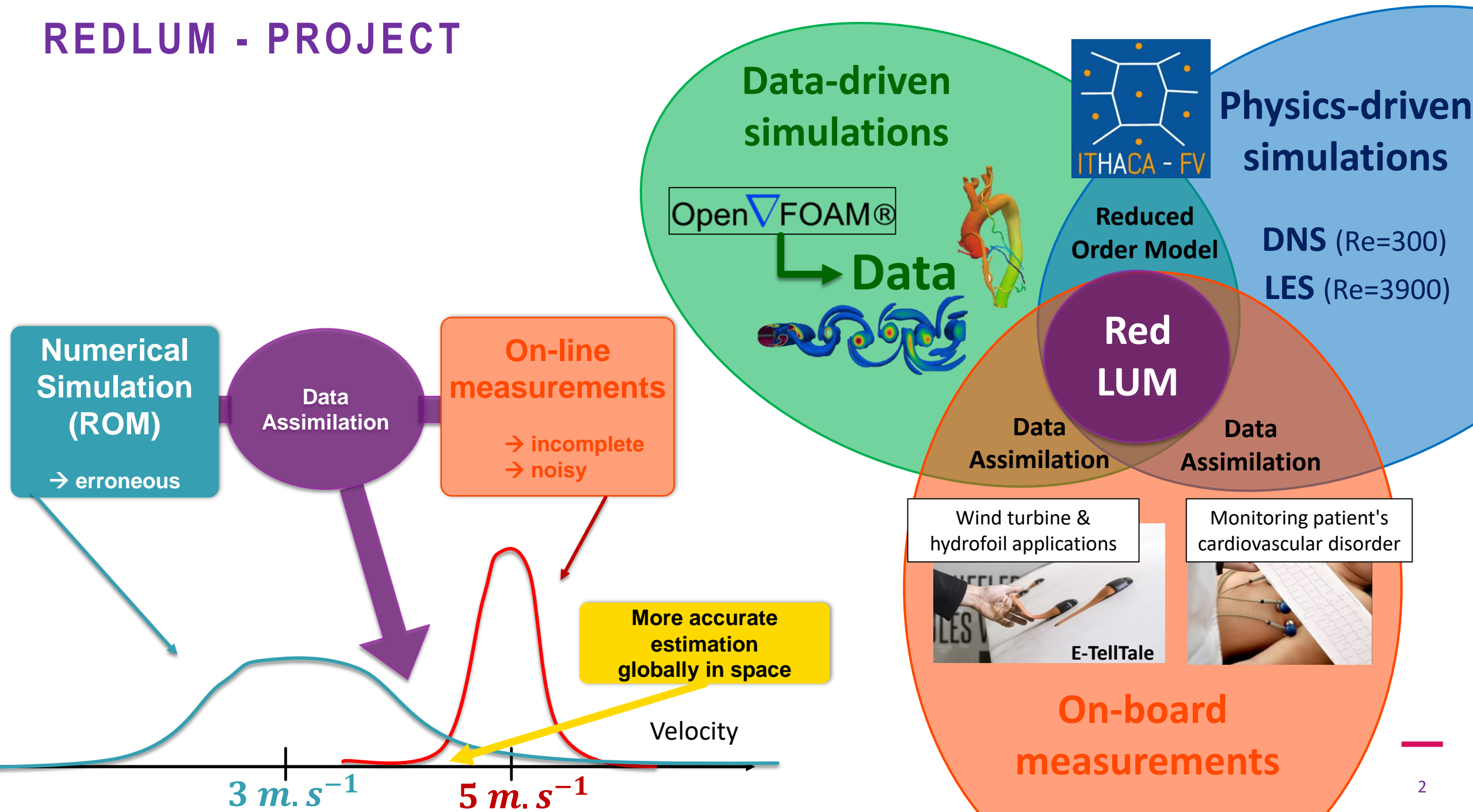
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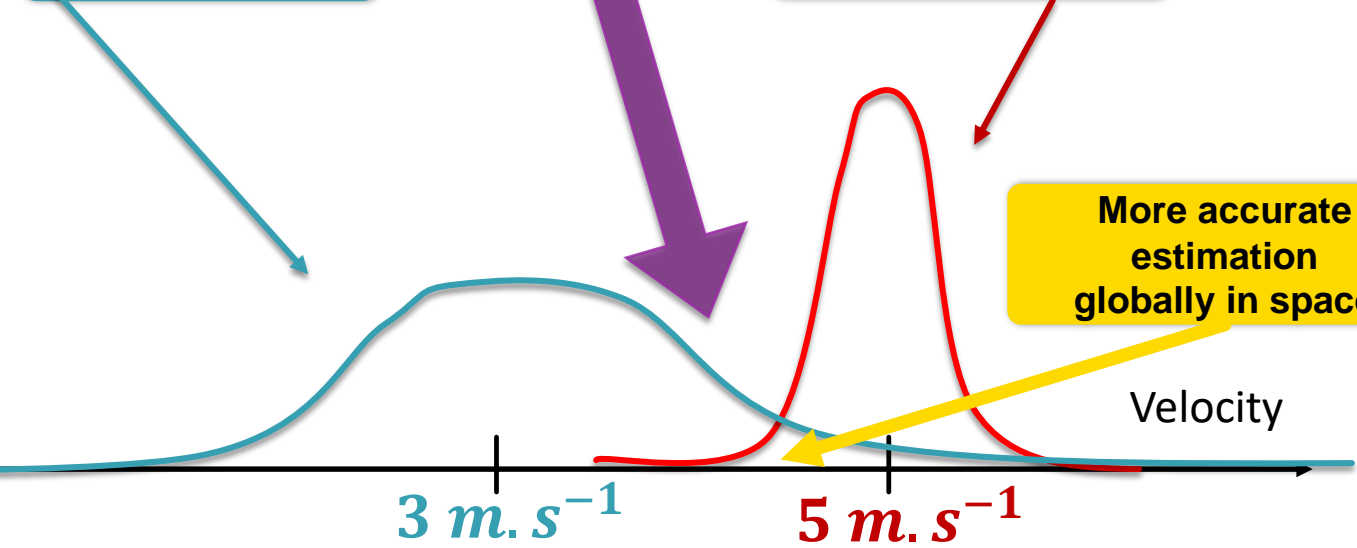
REDLUM - PROJECT

Need for uncertainty / errors quantification
→ Random dynamics

Numerical Simulation (ROM)
→ erroneous

Data Assimilation

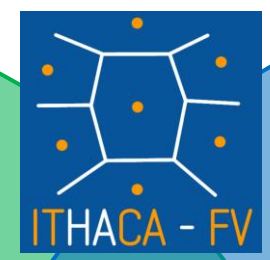
On-line measurements
→ incomplete
→ noisy



Data-driven simulations

OpenFOAM®

Data



Physics-driven simulations

Reduced Order Model

DNS (Re=300)
LES (Re=3900)

Red LUM

Data Assimilation

Data Assimilation

Wind turbine & hydrofoil applications

Monitoring patient's cardiovascular disorder

E-TellTale

On-board measurements

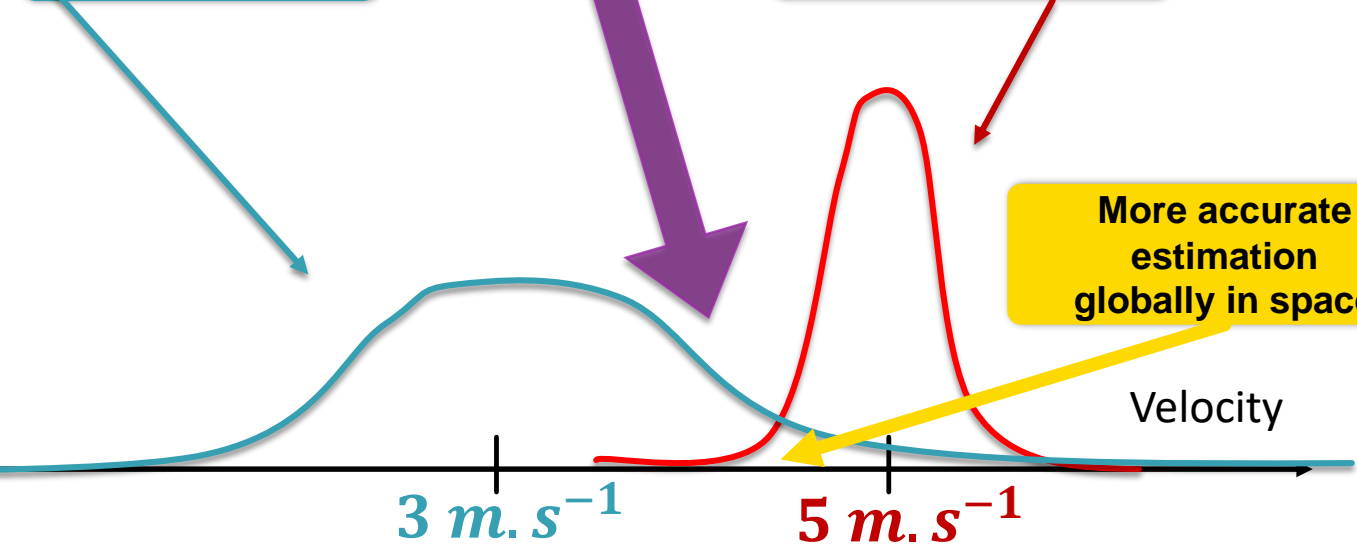
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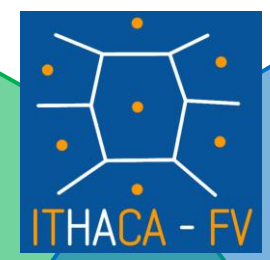
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Data-driven simulations

OpenFOAM®

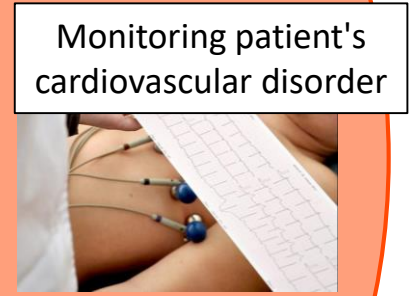
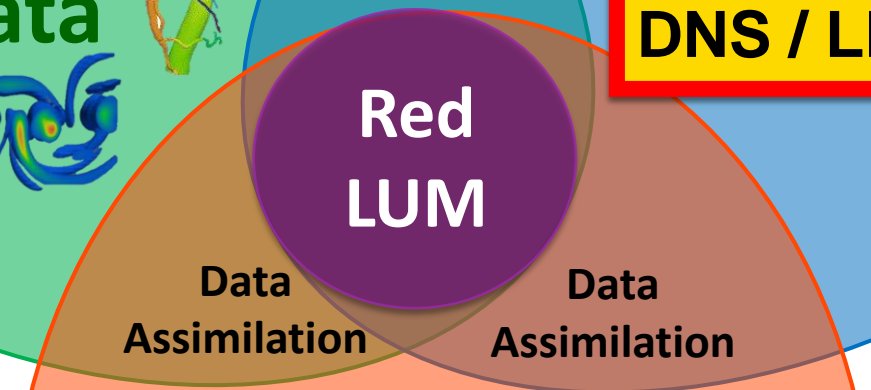
Data



Physics-driven simulations

Reduced Order Model

Random DNS / LES



On-board measurements

REDLUM - PROJECT

