

# An Open-Source Initiative Toward a Unified Framework For Modeling VIV

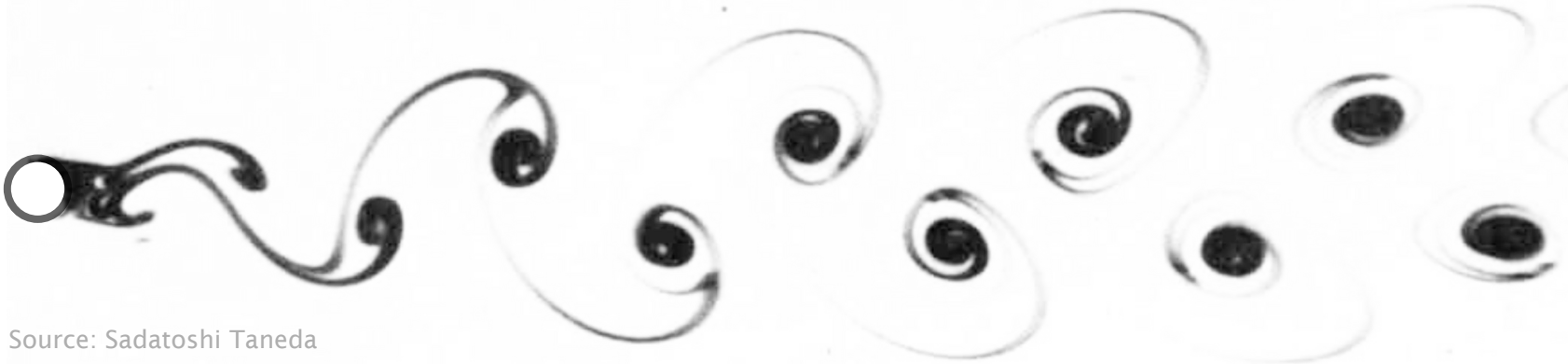


# Motivation



Source: Sadatoshi Taneda

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Precision  
Computational load



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## EUROCODES



Can be done by hand  
Large error in some cases



Precision  
Computational load

# Motivation

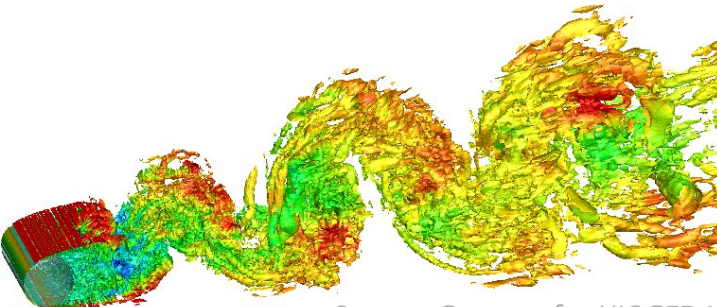


Source: Sadatoshi Taneda

## EUROCODES

	EUROCODES EN 1991
Actions on structures	

## CFD



Source: Cenario for HiOCFD4

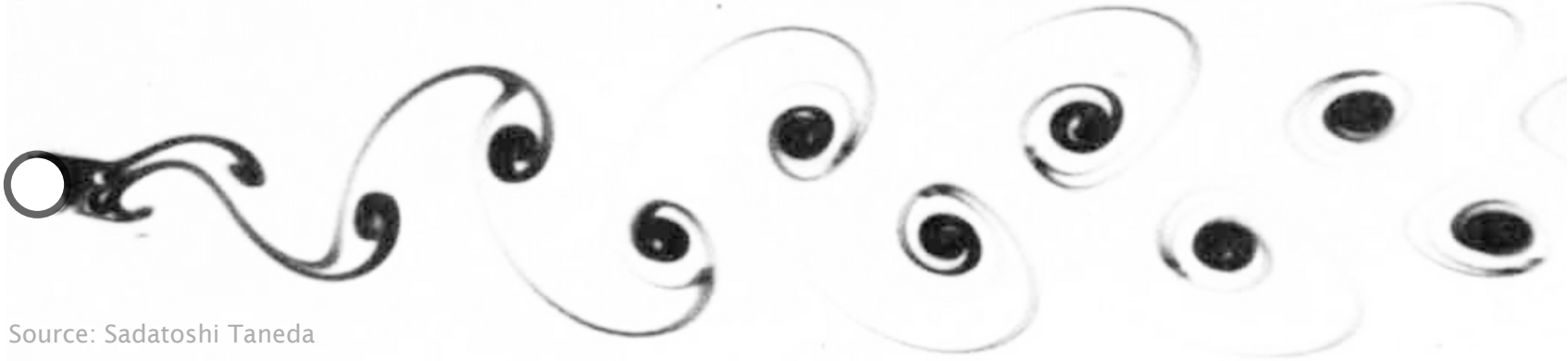
Can be done by hand  
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Takes weeks  
Very precise



Precision  
Computational load

# Motivation



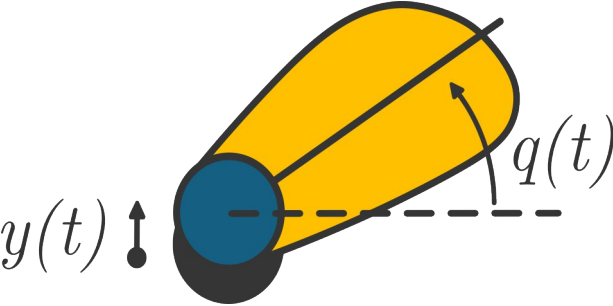
Source: Sadatoshi Taneda

## EUROCODES

EUROCODES  
EN 1991  
Actions on structures

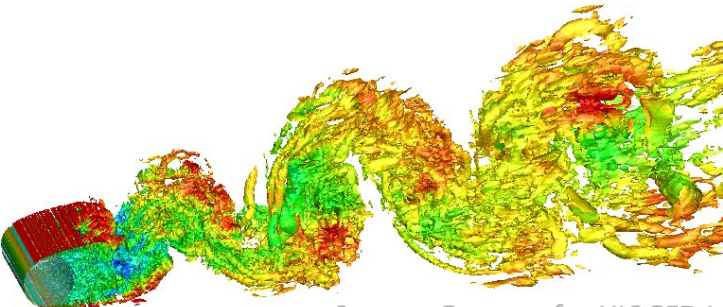
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## REDUCED-ORDER MODELS



Takes seconds ~ minutes

## CFD



Source: Cernaero for HiOCFD4

Takes weeks  
Very precise



Precision  
Computational load

# Motivation



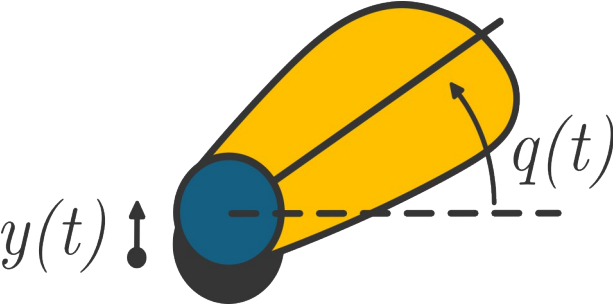
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## EUROCODES

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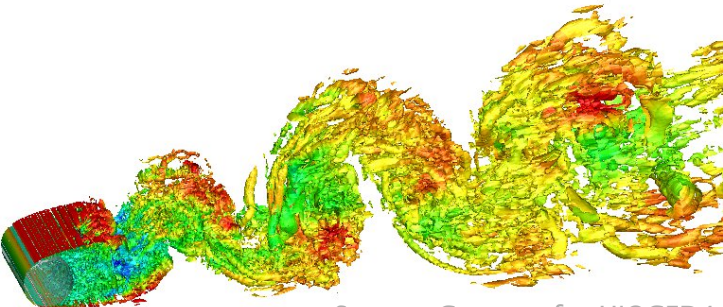
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## REDUCED-ORDER MODELS



Takes seconds ~ minutes  
**BUT ...**

## CFD

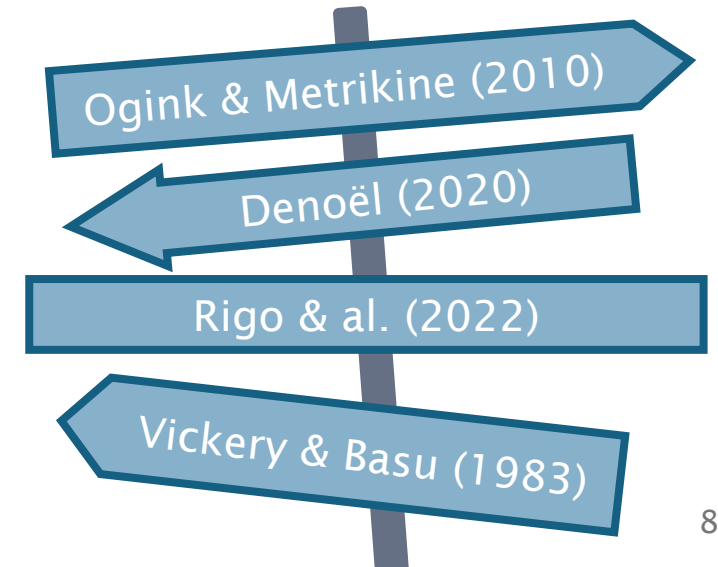
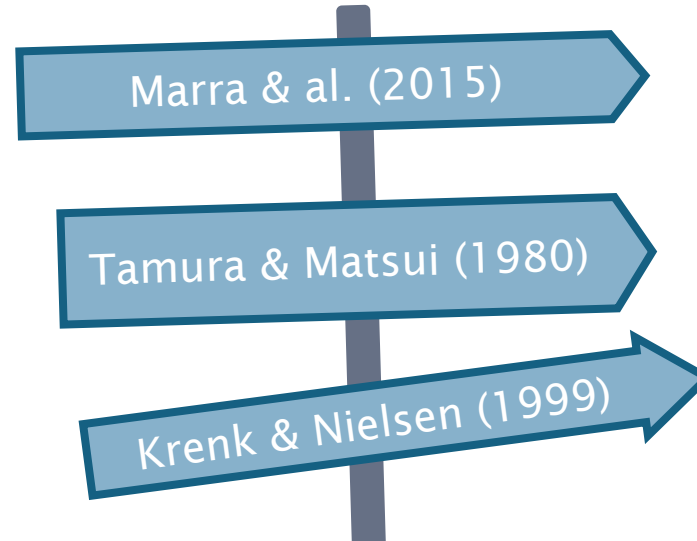
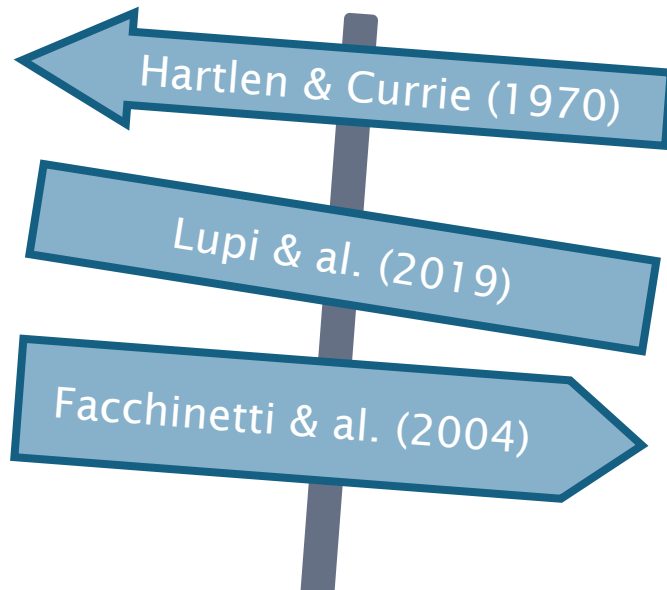


Source: Cenario for HiOCFD4

Takes weeks  
Very precise



## There is no consensus regarding VIV modeling



## There is no consensus regarding VIV modeling



Hartlen & Currie (1970)

Lupi & al. (2019)

Facchinetti & al. (2004)

Marra & al. (2015)

Tamura & Matsui (1980)

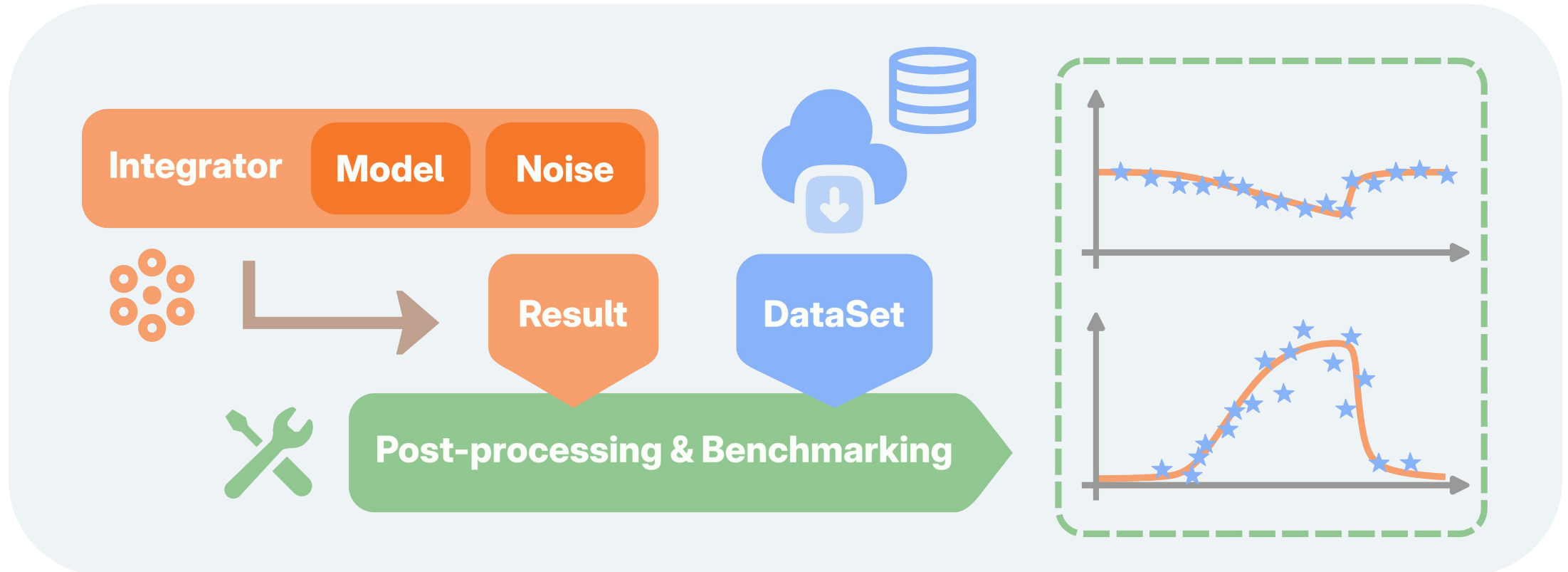
Krenk & Nielsen (1999)

Ogink & Metrikine (2010)

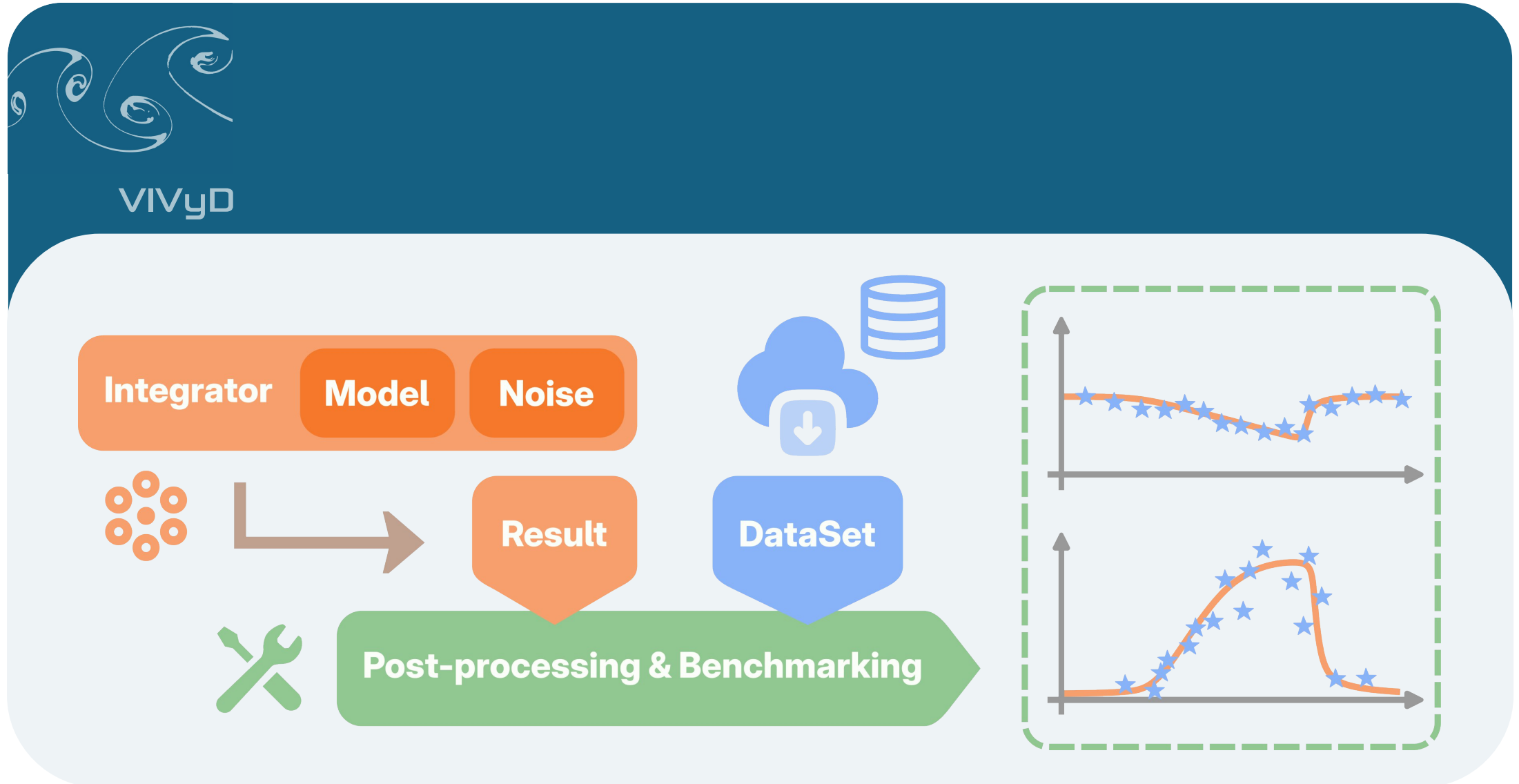
Denoël (2020)

Rigo & al. (2022)

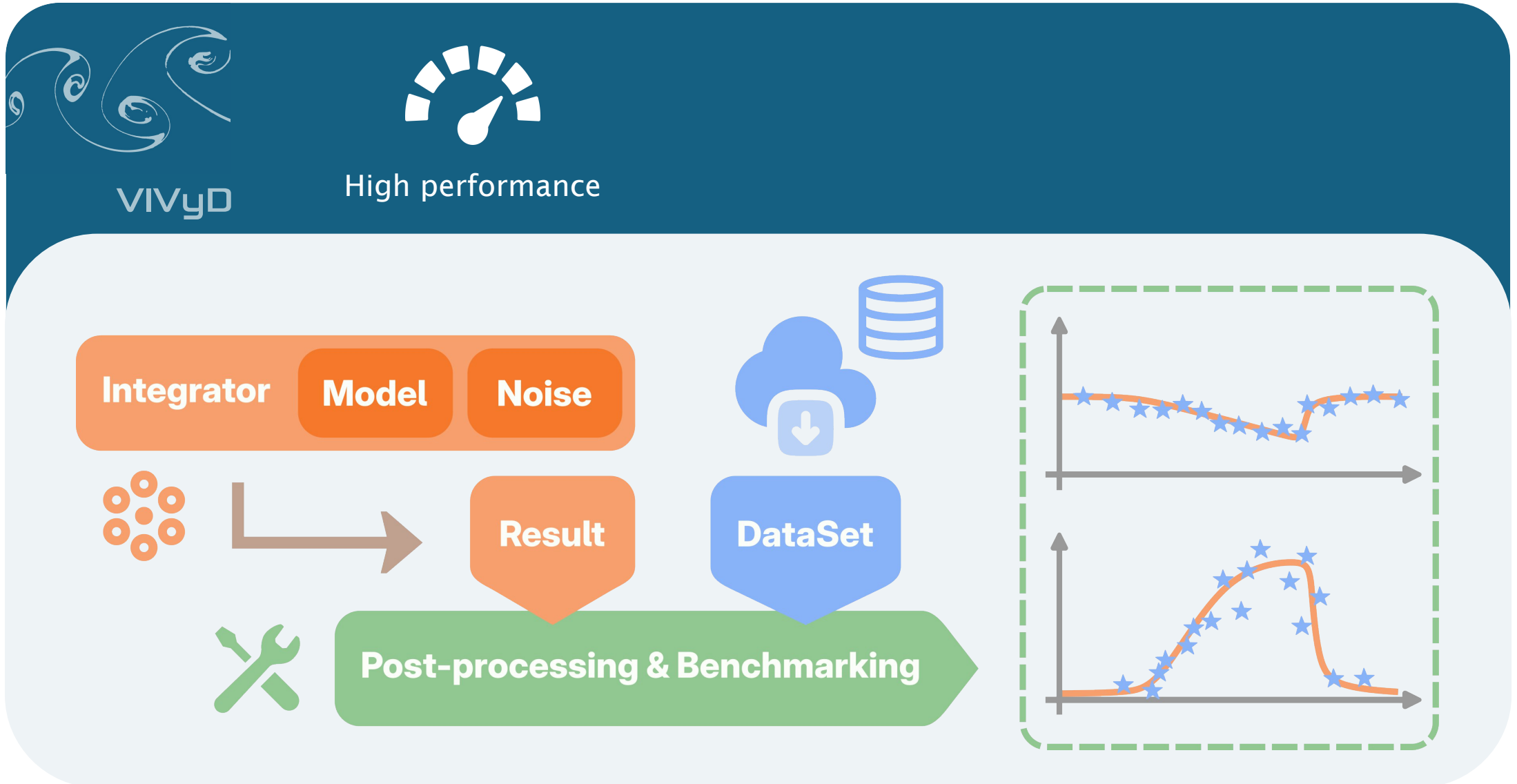
Vickery & Basu (1983)



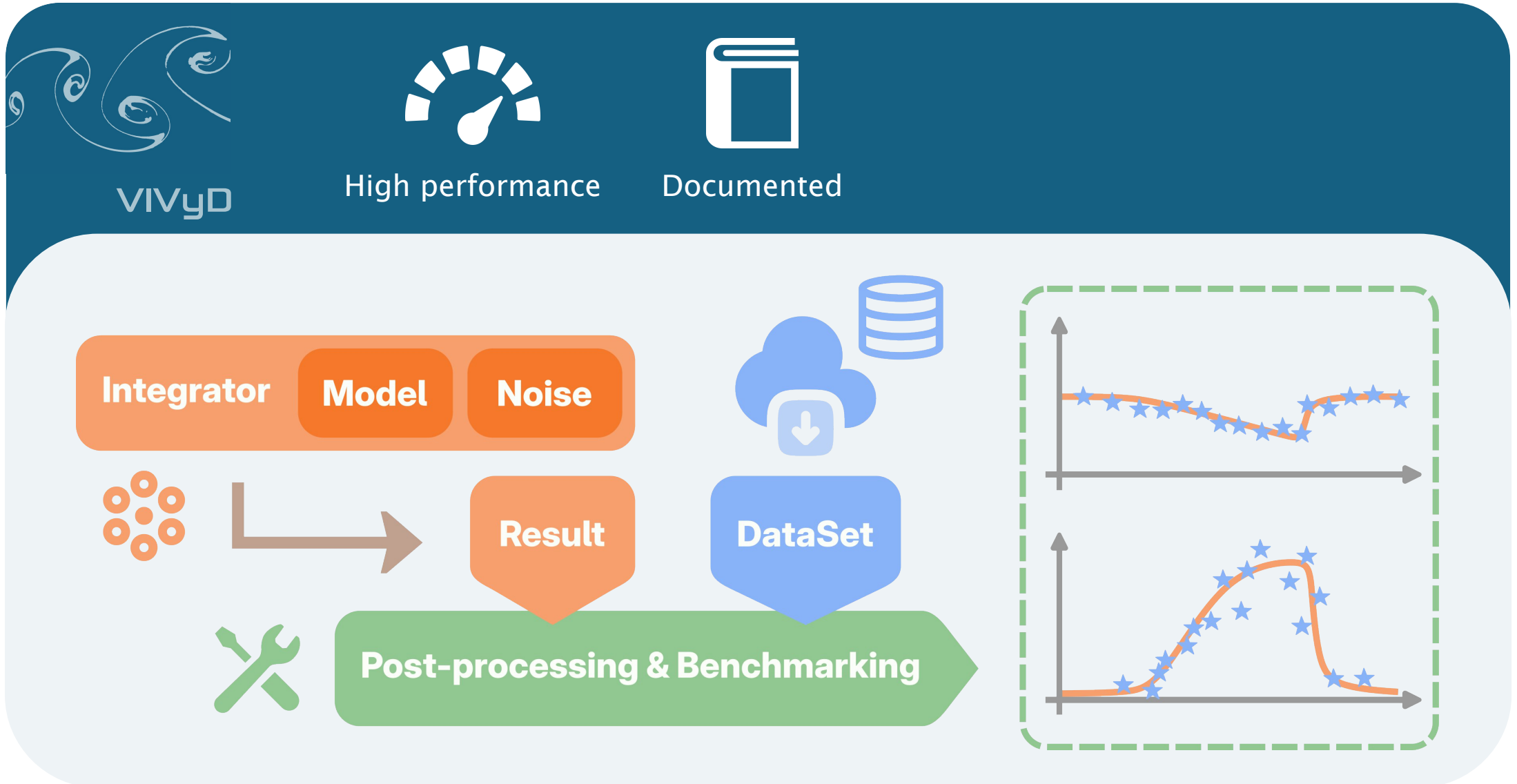
# Introducing VIVyD



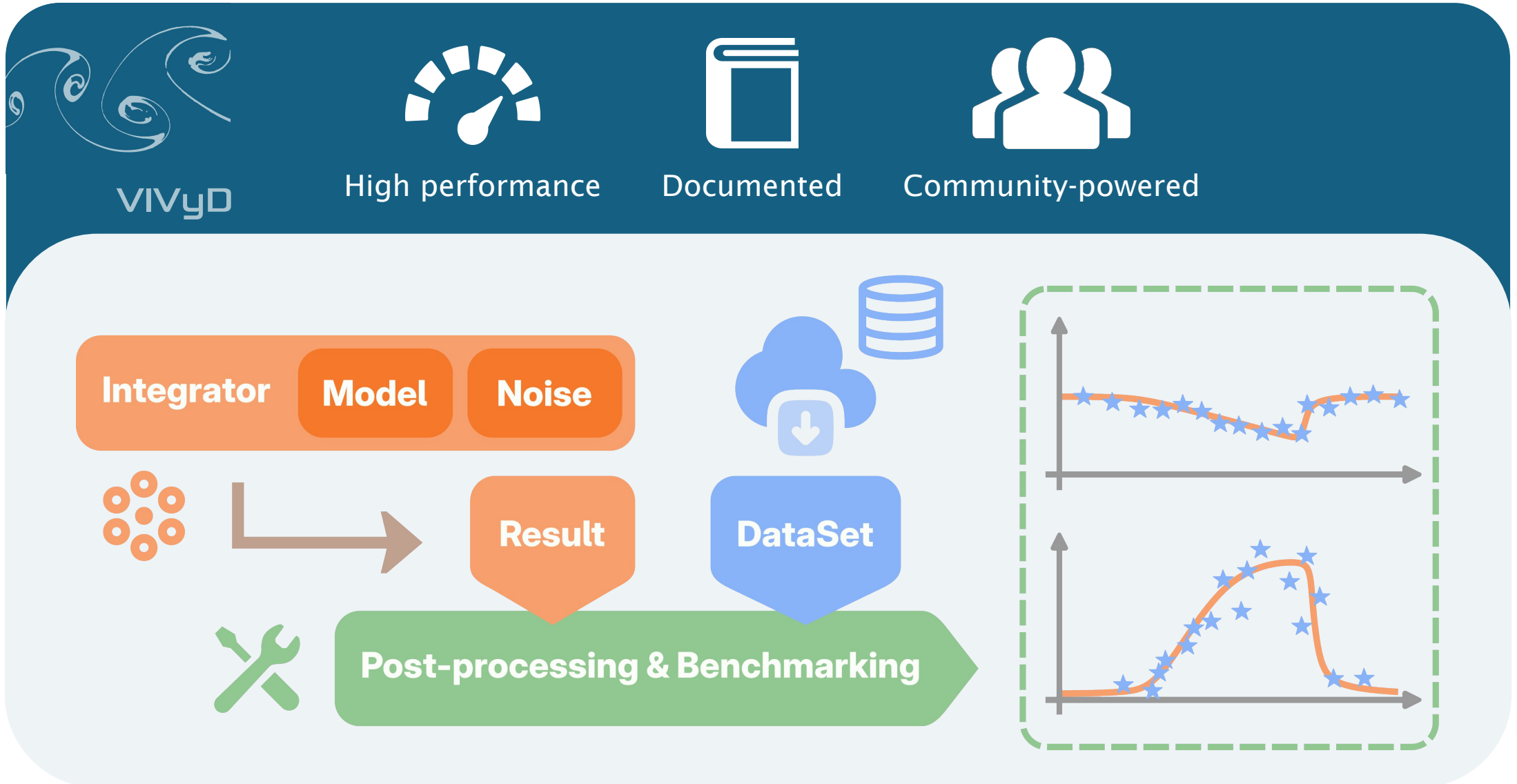
# Introducing VIVyD



# Introducing VIVyD



# Introducing VIVyD



VIVyD

High performance

Documented

Community-powered

Integrator

Model

Noise

Result

DataSet

Post-processing & Benchmarking

# Introducing VIVyD



VIVyD



High performance



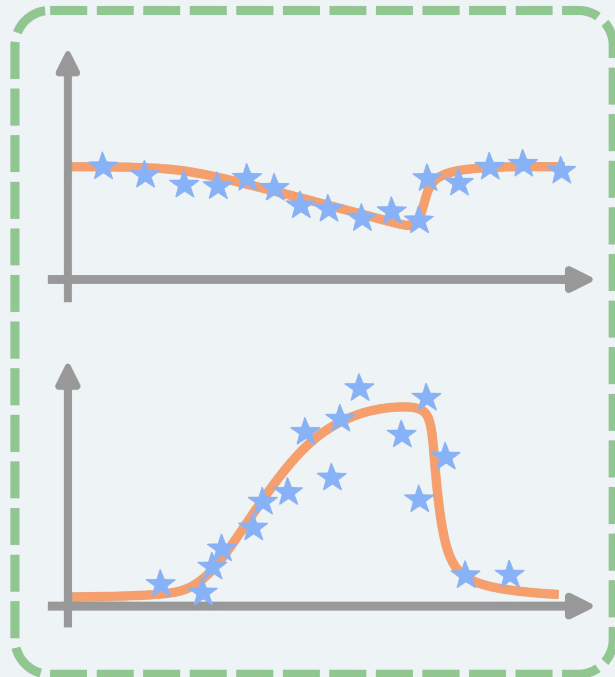
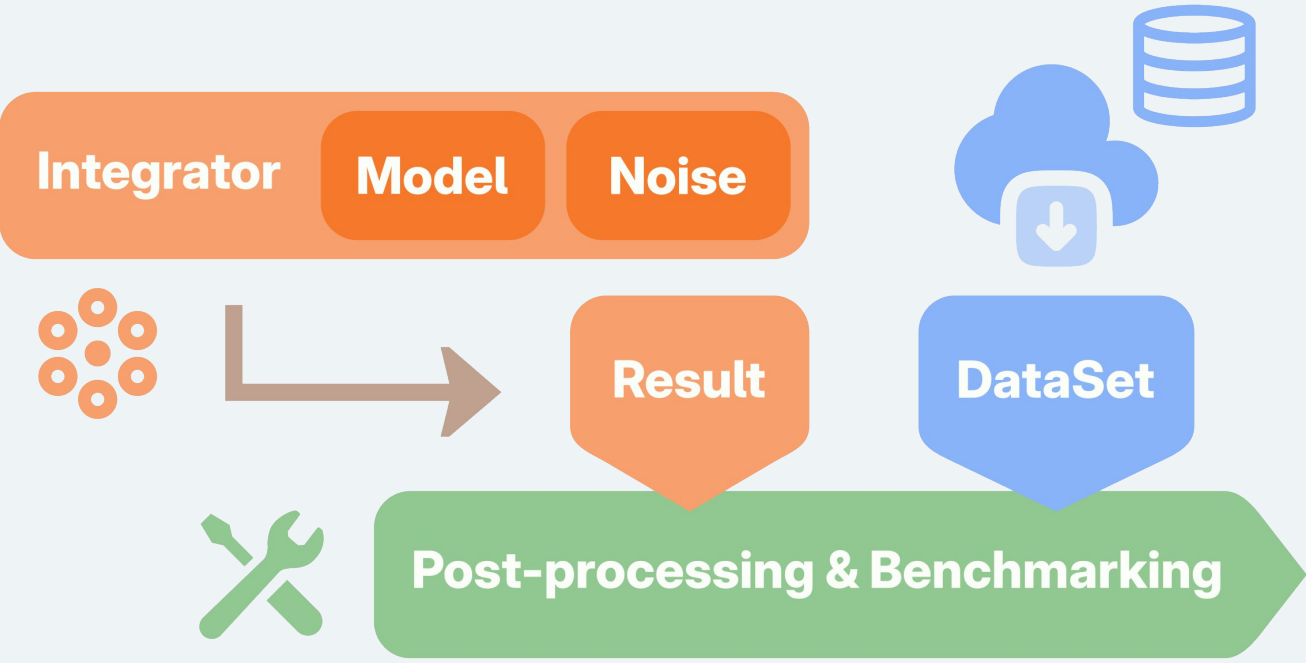
Documented



Community-powered



Peer-reviewed







**Thank you for your attention!**

**Any questions?**

