Motivation

# Large scale Finite Element solvers for the large eddy simulation of incompressible turbulent flows

author:

ORIOL COLOMÉS GENÉ

supervisor:

Santiago Badia

Departament d'Enginyeria Civil i Ambiental

February 11, 2016





- 1. Motivation
- 2. Residual-based VMS
- 3. Mixed FE VMS
- 4. Segregated Runge-Kutta
- 5. Segregated VMS
- 6. Conclusions

- 1. Motivation
- 2. Residual-based VMS
- 3. Mixed FE VMS
- 4. Segregated Runge-Kutta
- Segregated VMS
- Conclusions

Segregated VMS

- 2. Residual-based VMS Formulation **Energy statements** Numerical experiments Conclusions

- 1. Motivation
- 2. Residual-based VMS
- 3. Mixed FE VMS
  Formulation
  Block-preconditioning
  Numerical experiments
  Conclusions
- 4. Segregated Runge-Kutta
- Segregated VMS
- 6 Conclusions

Motivation

- 4. Segregated Runge-Kutta Formulation Numerical experiments Conclusions

Motivation

- 5. Segregated VMS Formulation Block-preconditioning Numerical experiments Conclusions

- 1. Motivation
- 2. Residual-based VMS
- Mixed FE VMS
- 4. Segregated Runge-Kutta
- 5. Segregated VMS
- 6. Conclusions

# Outline

Line 1.

Residual-based VMS

Segregated VMS

## Outline

- Line 1.
- Line 2.Less formal

Segregated VMS

# Outline

- Line 1.
- Line 2. Less formal
- Line 3. Less formal, different color.

Segregated VMS

Mixed FE VMS

#### **Blocks**

#### Standard Block

This is a standard block.

## Example Block

This is an example block.

#### Alert Block

This is an alert block.

