

VPIV

Virtual Particle Image Velocimetry

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VPIV – Gruppo di lavoro

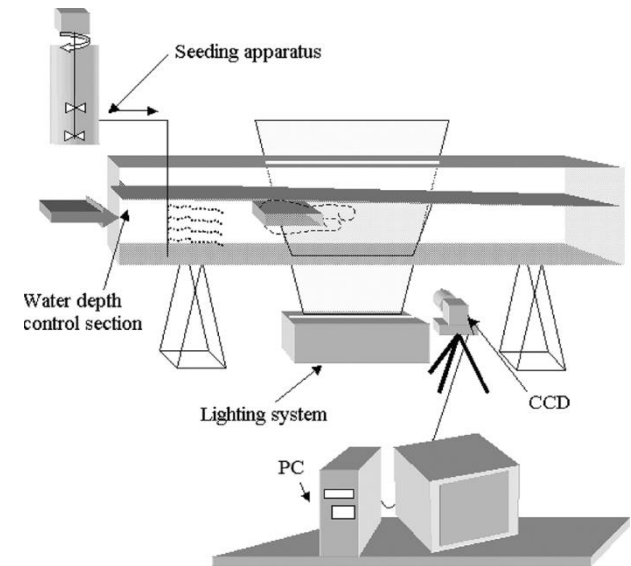
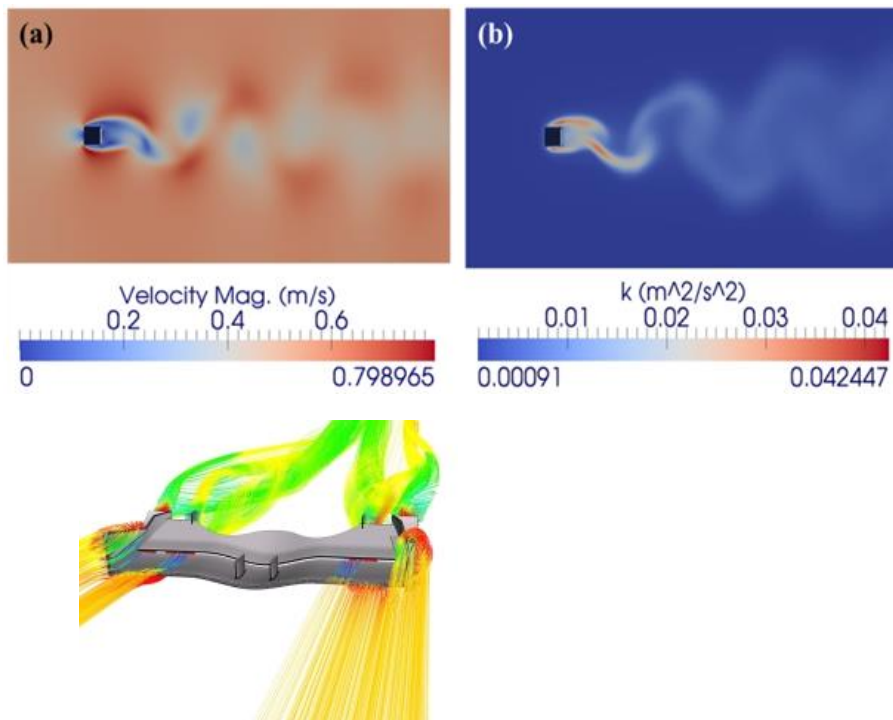


Responsabile della ricerca: Stefano Malvasi (Professore Associato)

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Personale esterno coinvolto: Gian Andrea Messa (Post-doc), Marco Negri (Dottorando), Umberto Morbiducci (Ricercatore)

VPIV – Cos'è?

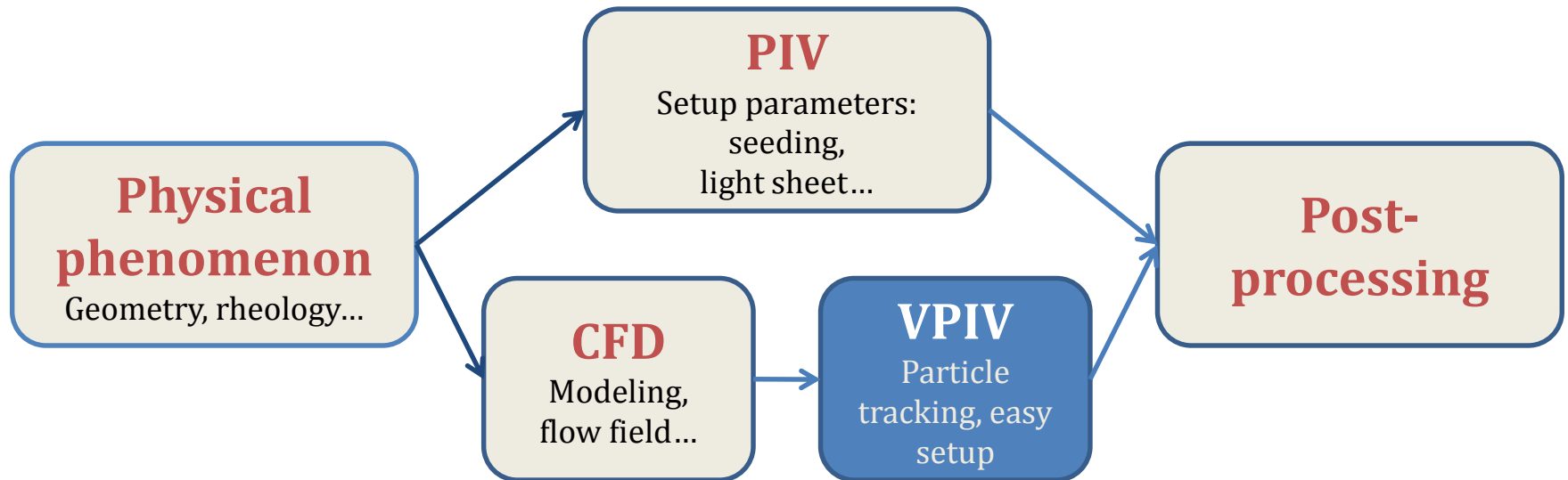


Traiettorie di particelle inseminate

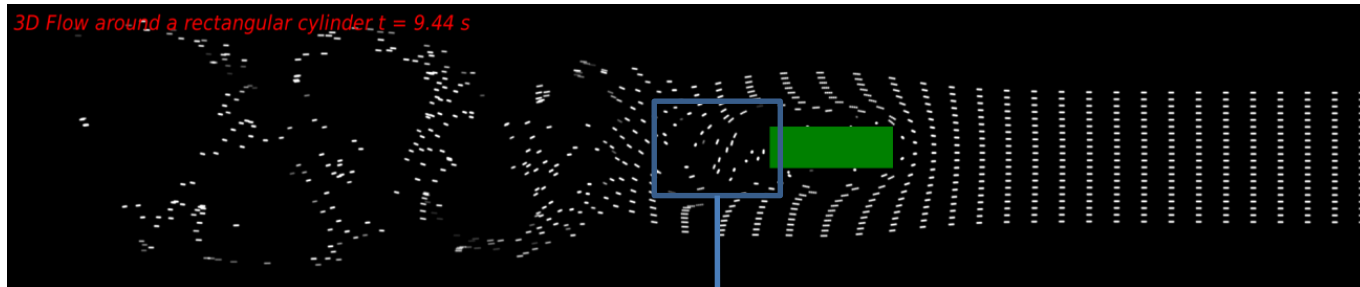
+

proprietà ottiche

VPIV – Perché? – Comparazione



VPIV – Perché? – Pre-processing



3D Flow around a rectangular cylinder $t = 9.44$ s

Virtual
analysis
VPIV

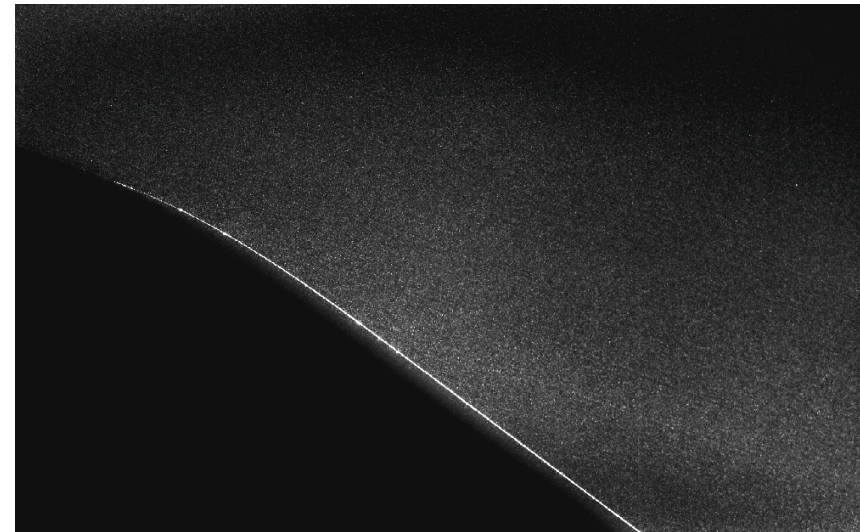
Vortex Shedding



Experimental
image
PIV/PSV

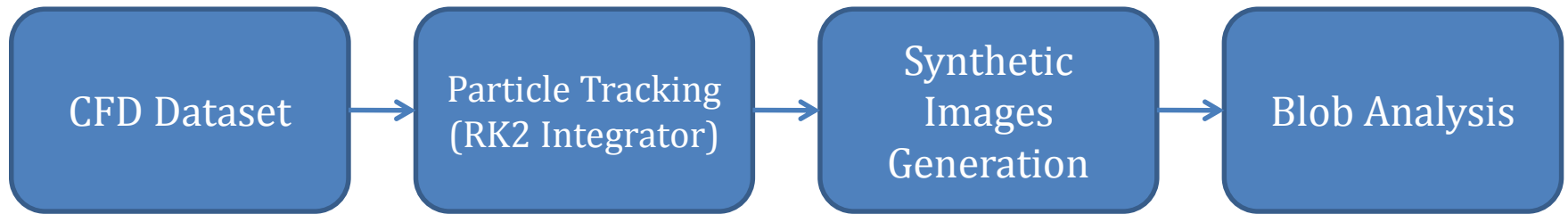
VPIV – Ipotesi

- ✓ Particelle traccianti **sufficientemente piccole**
- ✓ **Inseminazione omogenea**

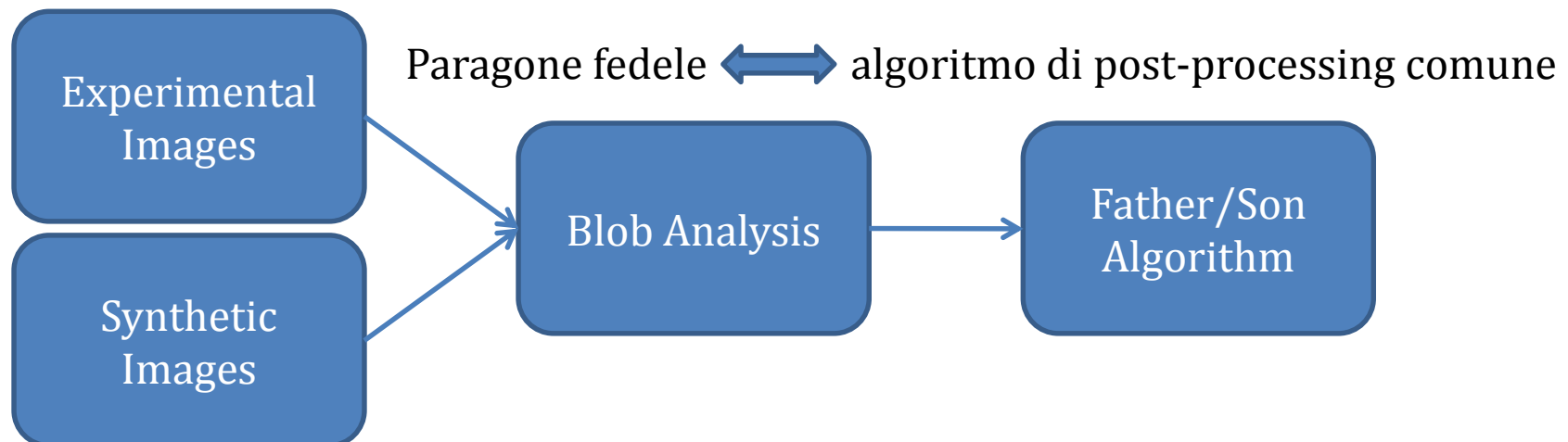


No collisioni fra particelle → maggiori possibilità di esperimenti

VPIV – Come? – Workflow



Immagini virtuali – Proprietà ottiche specifiche



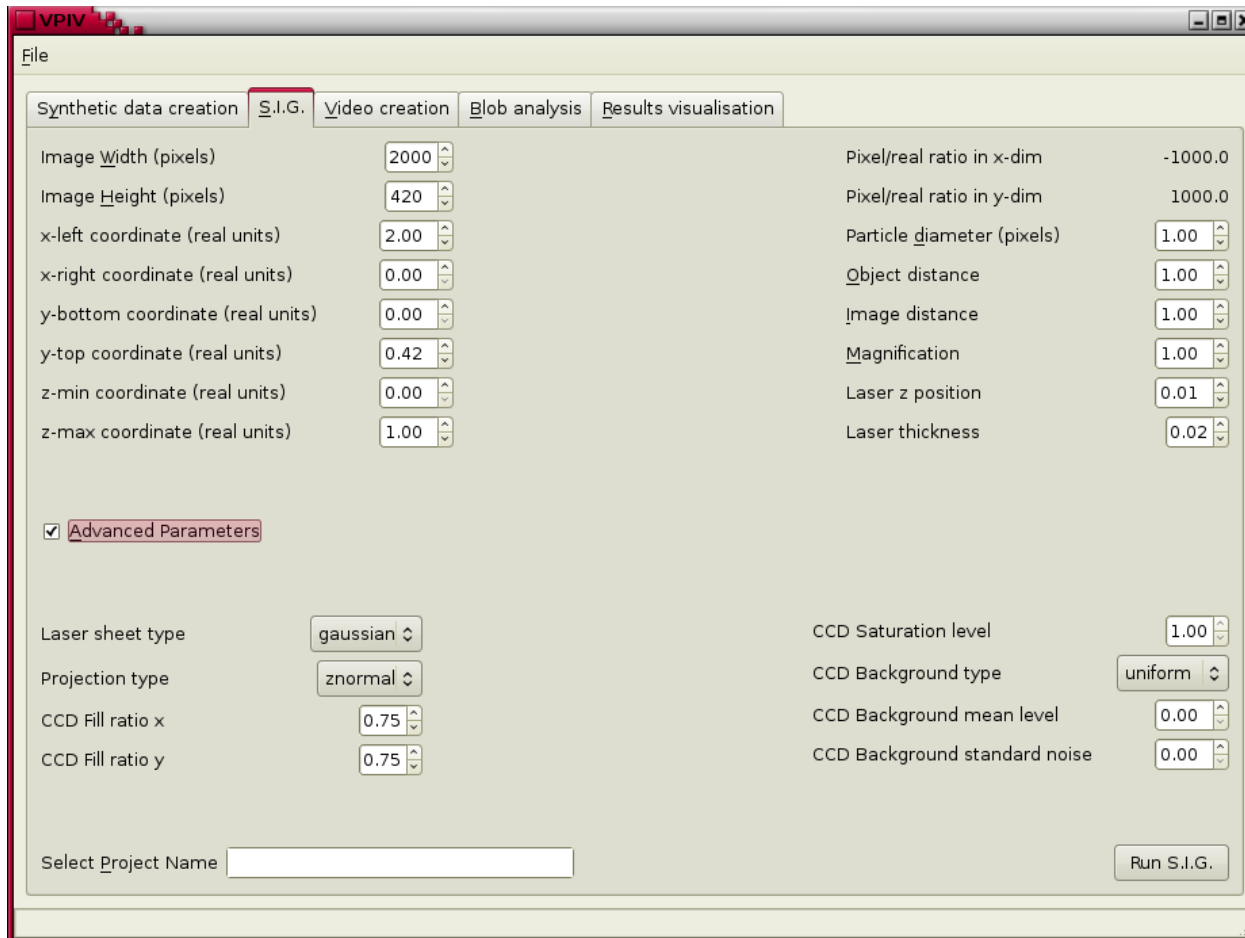
VPIV – Come? – Ottimizzazione

Pre-processing per ottimizzare il setup



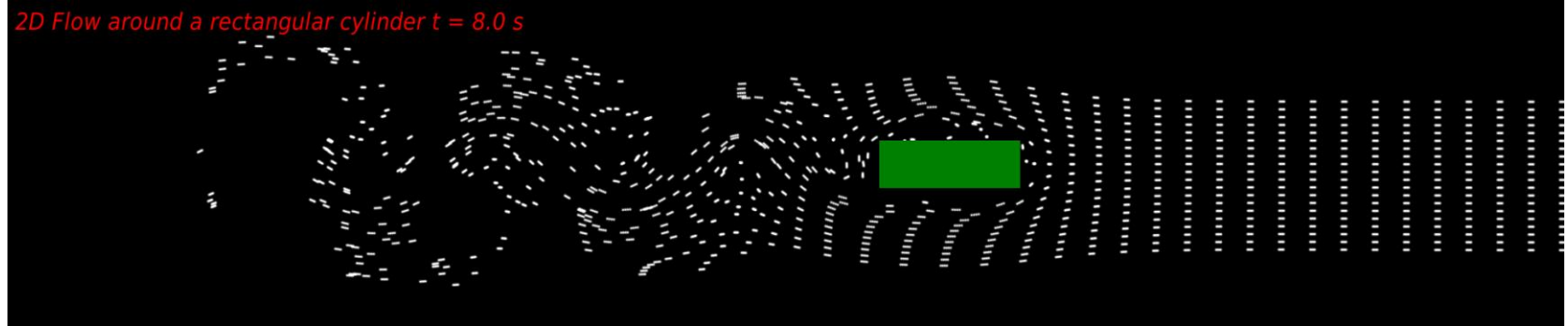
- ✓ Risparmio di soldi e tempo
- ✓ Setup ottimale per la campagna sperimentale

VPIV – Interfaccia software

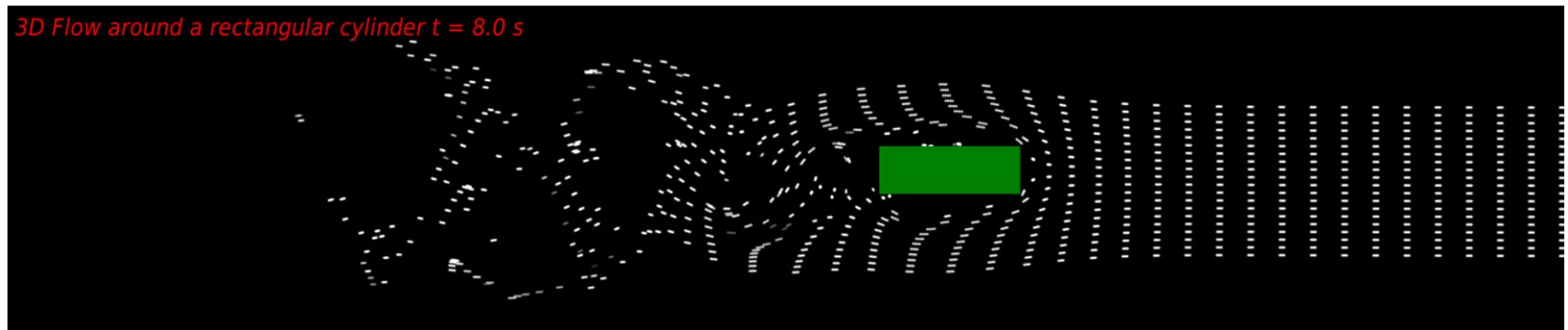


VPIV – Immagini da CFD

2D



3D



VPIV – Video da CFD

2D

2D Flow around a rectangular cylinder $t = 0.0$ s



3D

3D Flow around a rectangular cylinder $t = 0.0$ s



VPIV – Didattica

- ✓ **Supporto didattico** per introdurre PIV/PSV
- ✓ Paragonare **casi studio** (numerici e sperimentali)



Comprensione facilitata di campi di moto complessi

VPIV – Ringraziamenti

Grazie per la cortese attenzione!

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The synthetic images used in the present work were generated using the EUROPIV Synthetic Image Generator which is described in B. Lecordier, J. Westerweel. The EUROPIV Synthetic Image Generator (S.I.G.). Proceedings of the EUROPIV 2 Workshop on Particle Image Velocimetry. M. Stanislas, J. Westerweel, J. Kompenhans Editors. Springer Verlag, 2004.