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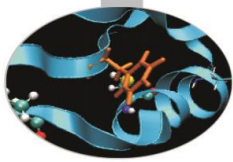
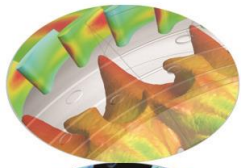
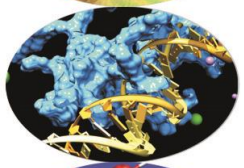
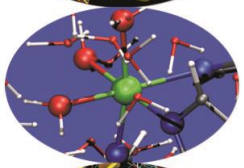
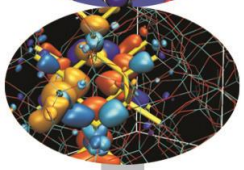


VPIV
Virtual Particle Image Velocimetry

Francesco Pasqua, *CINECA – HPC and innovation Unit*

18-06-2014

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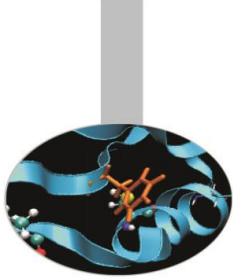
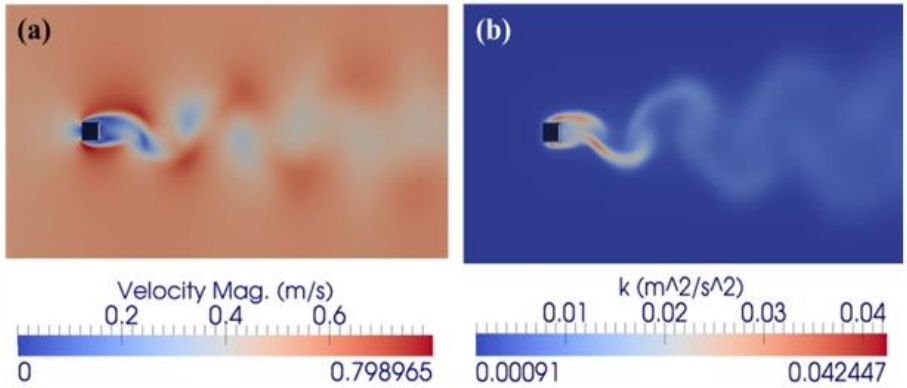
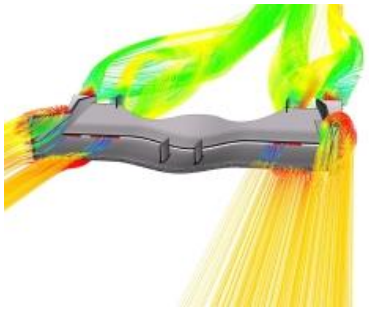
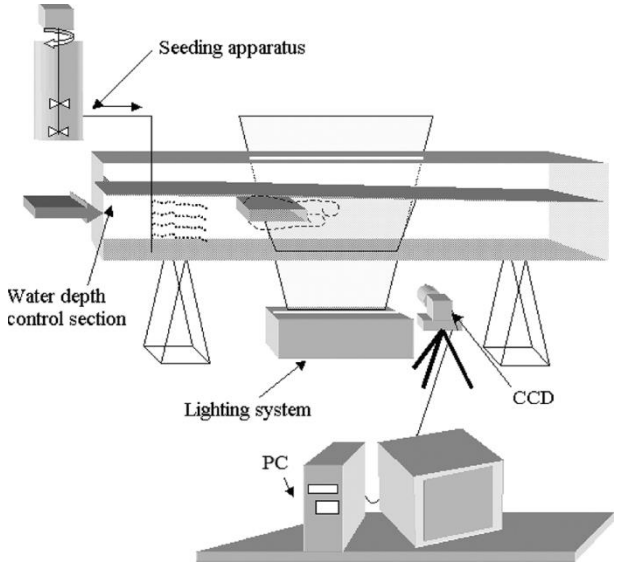


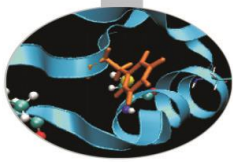
VPIV – What?



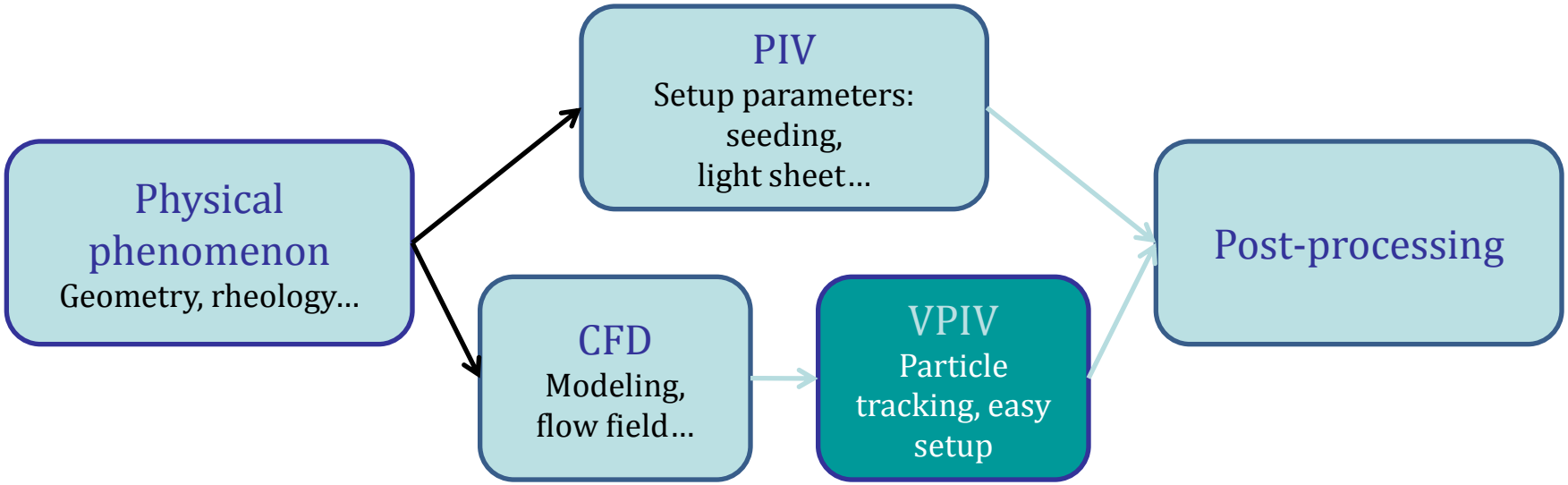


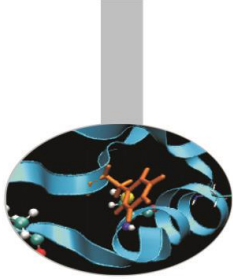


Seeded particle trajectories + optical properties

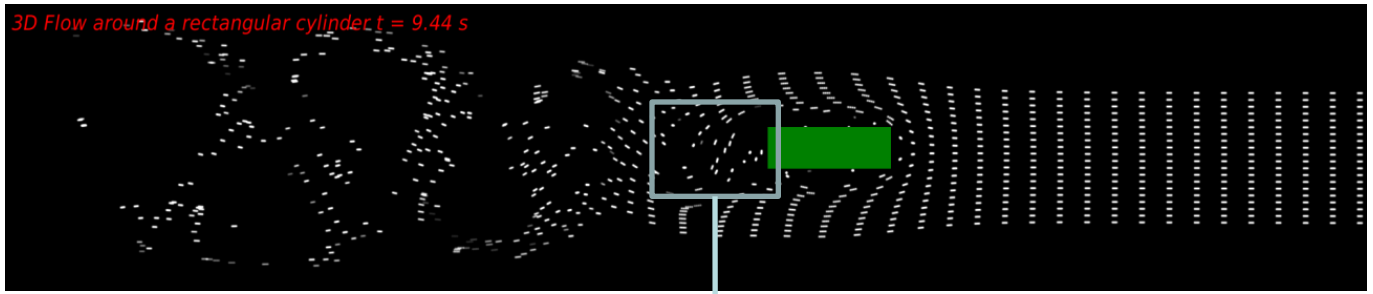


VPIV – Why? – Comparison





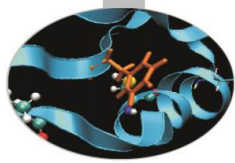
VPIV – Why? – Pre-processing



Virtual analysis VPIV

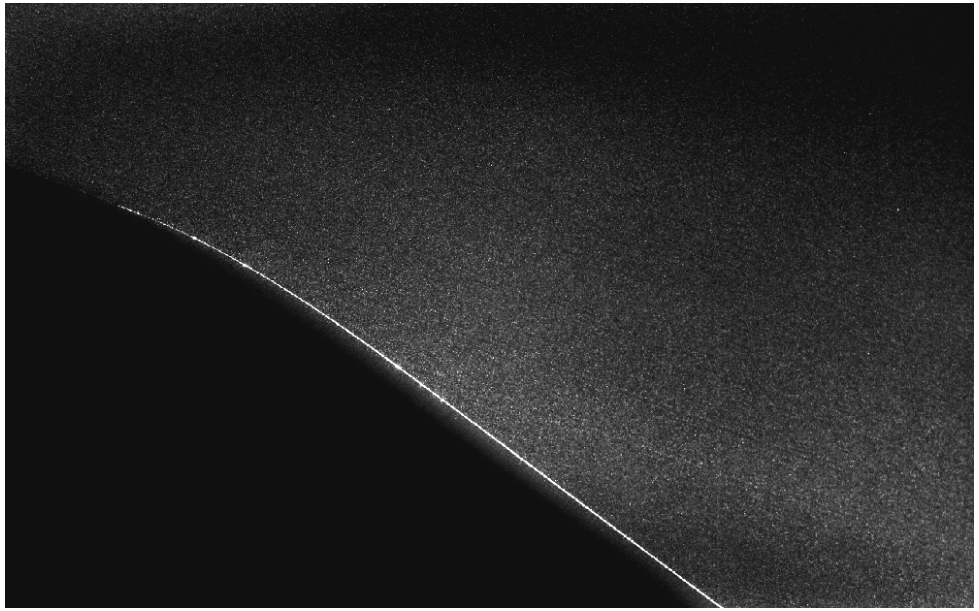
Vortex Shedding

Experimental image PIV/PSV



VPIV – Hypothesis

- ✓ Sufficiently small tracer particles
- ✓ Homogeneous seeding



No collisions between particles

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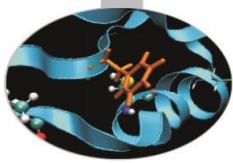
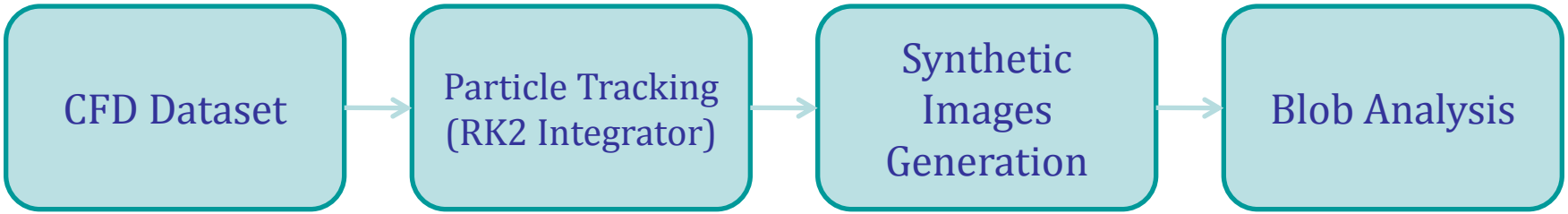
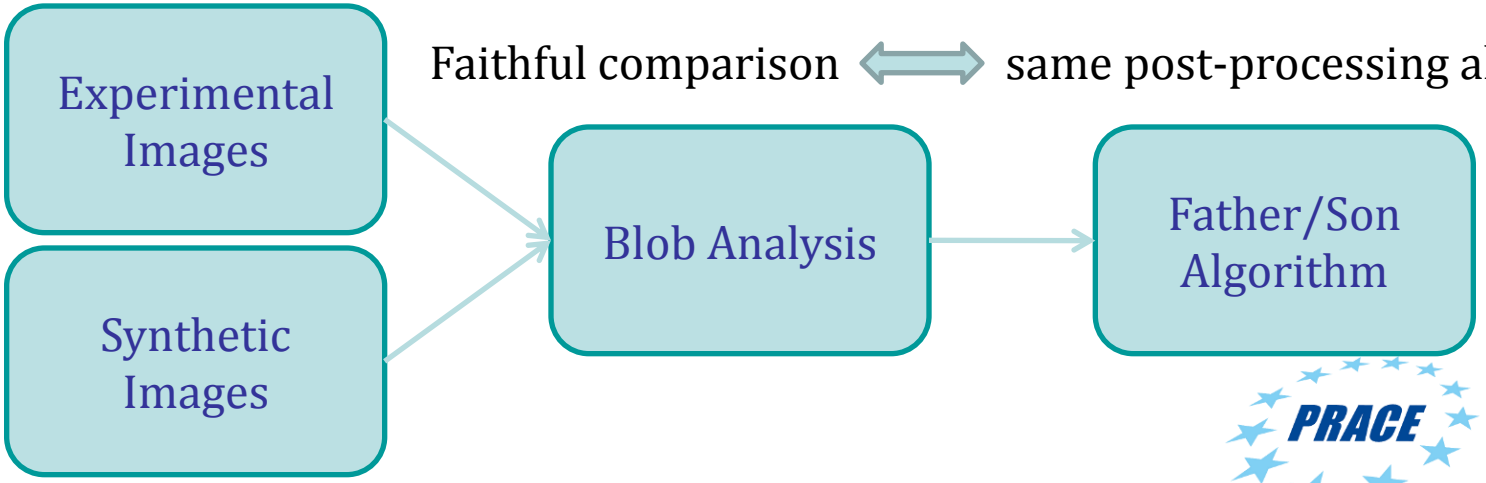
more experimental possibilities



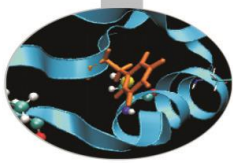
VPIV – How? – Workflow



Virtual images – Specific optical properties



Faithful comparison ⟺ same post-processing algorithm



VPIV – How? – Optimisation

Pre-processing for experimental setup optimisation

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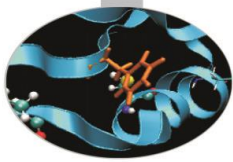
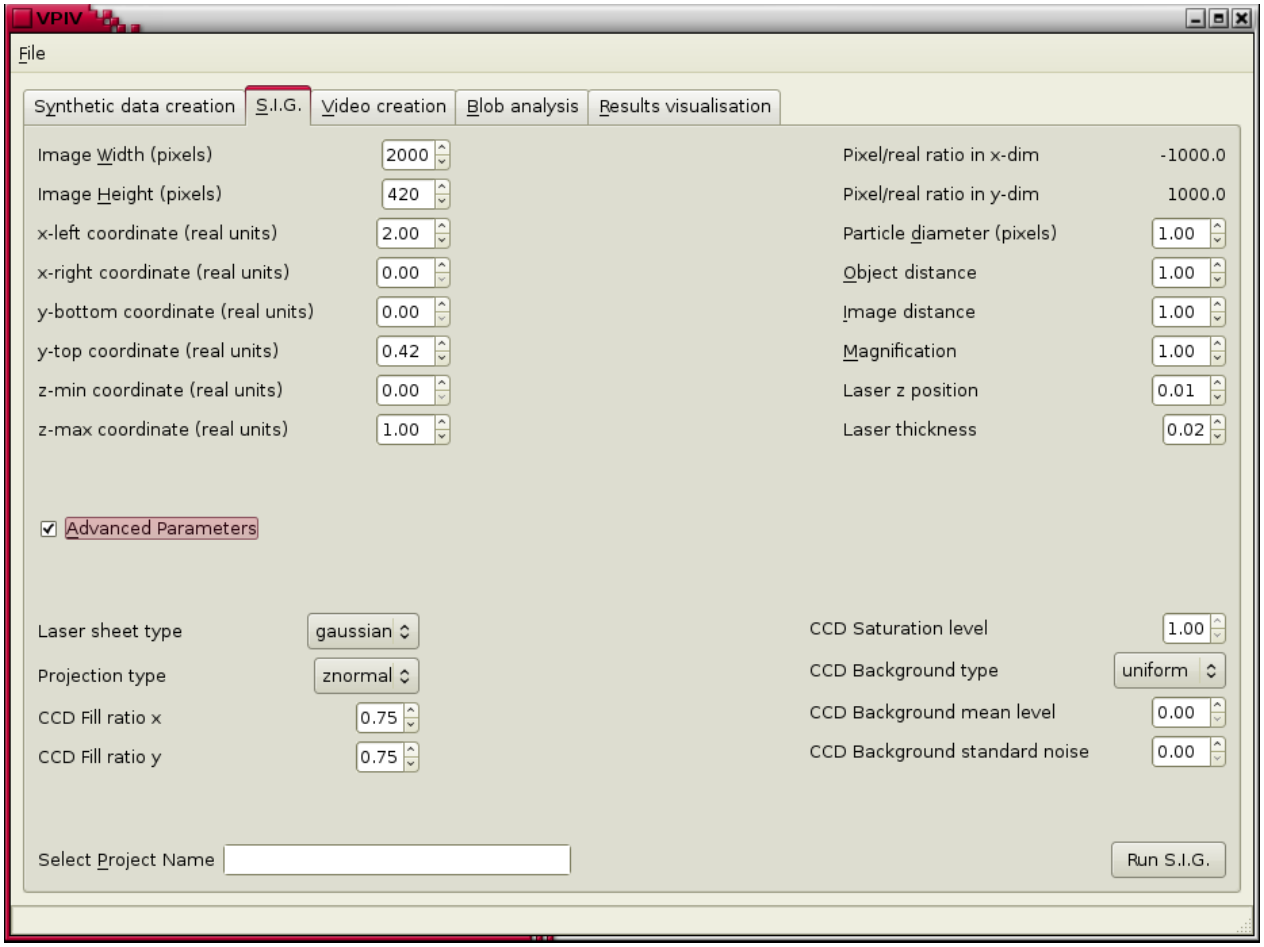
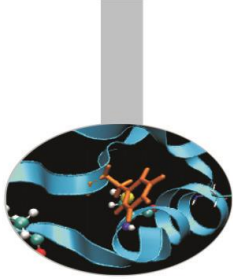
- ✓ Money and time saving
- ✓ Optimal setup for the experimental campaign



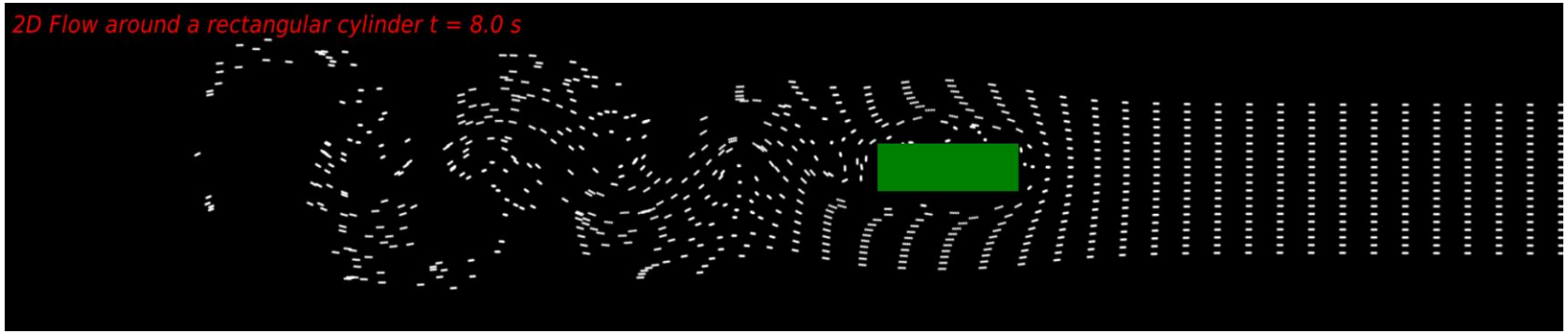
VPIV – Software GUI



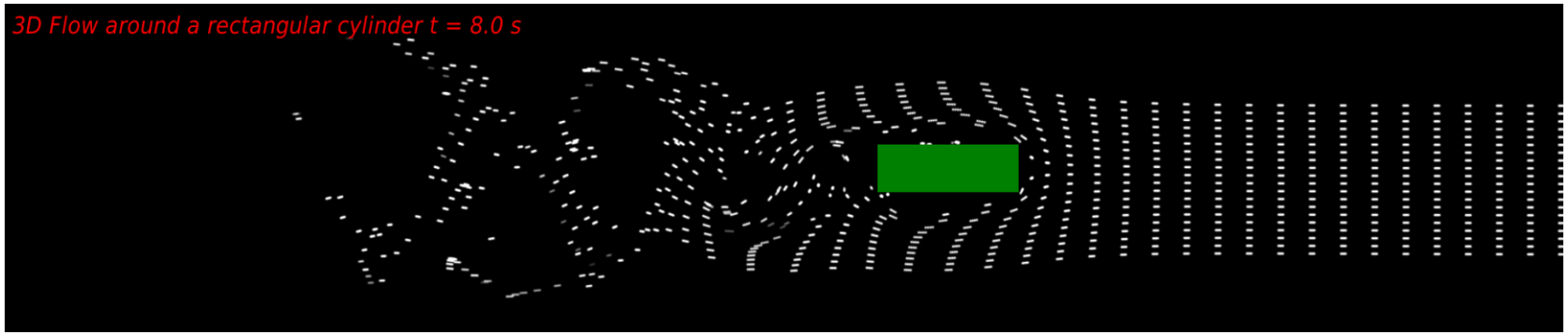


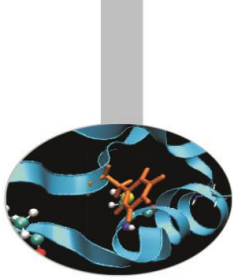
VPIV – Images from CFD

2D



3D

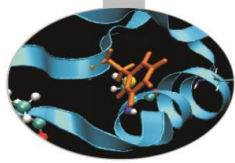




VPIV – Videos from CFD

2D

3D



VPIV – Didactical

- ✓ Didactical support for PIV/PSV introduction
- ✓ Comparison of case studies (numerical and experimental)

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Easy understanding of complex flow fields

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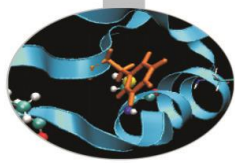

VPIV – Acknowledgements

Thank you for your kind attention!

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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.

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