

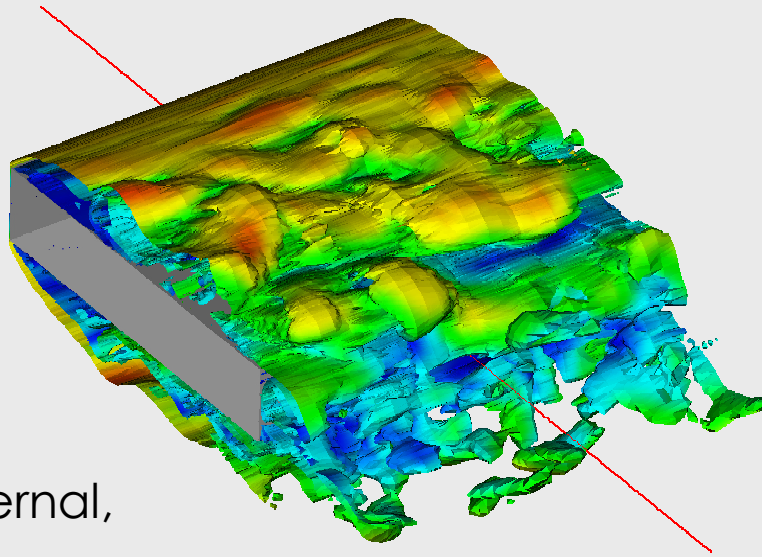
The logo for BARC, featuring the letters "BARC" in a bold, white, sans-serif font, centered within a dark, swirling, flame-like shape.

a
Benchmark
on the
Aerodynamics
of a
Rectangular
5:1
Cylinder

Aims of the benchmark:

- to deeply investigate one **specific problem in the aerodynamics of bluff bodies**, with contributions coming from as many researchers as possible worldwide;
- to assess the consistency of **wind tunnel measurements** carried out in different facilities;
- to assess the consistency of **computational results** obtained through different flow models and numerical approaches;
- to **compare** experimental and computational results;
- to assess the possibility of developing **integrated procedures** relying on both experimental and computational outcomes;
- to develop **Best Practices** for experiments and computations.

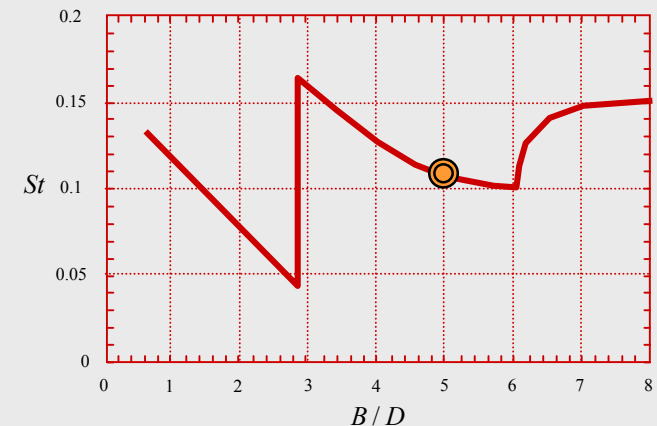
Object of the benchmark:



- external,
- high Reynolds number,
- turbulent, separated, unsteady flow
- around a stationary rectangular cylinder.
- associated aerodynamic loads.

main set-up specifications

- angle of attack $\alpha = 0$
- $2 \times 10^4 \leq Re = UD/\nu \leq 6 \times 10^4$
- turbulence intensity $I_u \leq 0.01$
- sharp edges ($R/D \leq 0.05$)
- chord-to-depth ratio $B/D = 5$



Output for Wind Tunnel tests and Computational simulations

Both set-up information and output data are classified as:

- **required**, i.e. data that participants are requested to provide;
- **encouraged**, i.e. additional data that participants are encouraged to provide;
- any **additional data** can be provided by the participants.

Requested set-up information and output data are set in separate sheets:

- Annex 1 - *Requests for Computational Simulations*;
- Annex 2 - *Requests for Wind Tunnel Tests*.

Set-up and output data format are described in the Annexes.

Data can be uploaded by authors and downloaded by other participants on the benchmark website <http://www.aniv-iawe.org/barc>



Organising Committee:

 Gianni BARTOLI	University of Florence
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 Guido BURESTI	University of Pisa
 Francesco RICCIARDELLI	University of Reggio Calabria
 Maria Vittoria SALVETTI	University of Pisa
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 Tetsuro TAMURA	Tokyo Institute of Technology (JAP)
 Mark THOMPSON	Monash University (AUS)

WHEN and WHERE

The benchmark duration

The benchmark spans over three years in the period 2008-2011

The kickoff

- July 2008 First announcement during the VI Colloquium on Bluff Body Aerodynamics and Applications (BBAA VI) in Milan (Italy).
- Fall 2008 Announcement through International Journals in many scientific fields

A dedicated web page opened within the ANIV website:

<http://www.aniv-iawe.org/barc>

e-mail:

barc@aniv-iawe.org

Calendar of the events

- Summer 2009 5th European and African Conference on Wind Engineering (EACWE) - Florence (Italy)
 - to summarise the results obtained by the contributors during the first year of activity.
- Summer 2010 5th International Symposium on Computational Wind Engineering (CWE) - Chapel Hill, North Carolina (USA)
 - to summarise the results obtained by the contributors during the second year of activity.
- Summer 2011 13th International Conference on Wind Engineering (ICWE) - Amsterdam (The Netherlands)
 - closure of the benchmark problem.