

Weekly Activity Review

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Madrid, October 23th 2010.

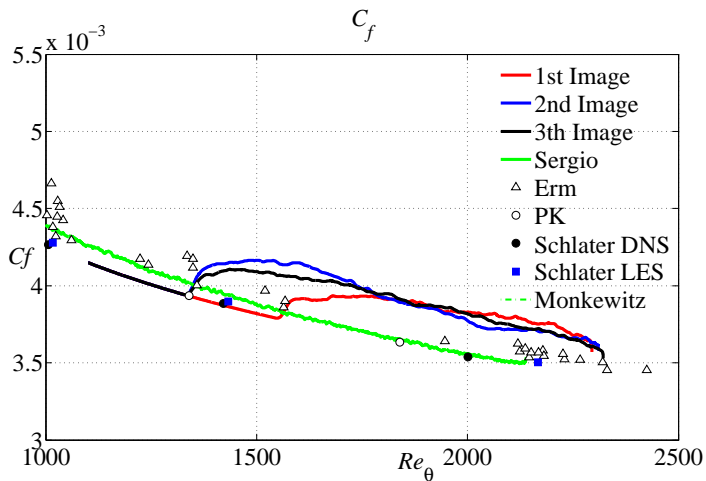
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- ▶ 2-BL's Setup
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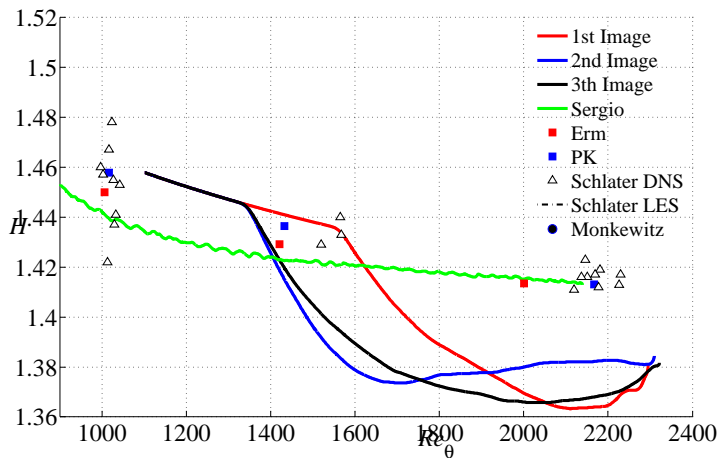
2-BL's Setup

- ▶ **BL1 Setup:** Low Resolution BL $Re_\theta = 1100 - 3130$
 - ▶ **Step 4:** Run the different L_z extensions with $\Delta z^+ \approx 5.68$
 - ▶ Case 1: $L_z = 5.80 \cdot 2\pi$: 2561x360x1024 **DONE**
 - ▶ Case 2: $L_z = 8.70 \cdot 2\pi$: 2561x360x1536 **DONE**
 - ▶ Case 3: $L_z = 13.00 \cdot 2\pi$: 2561x360x2304 **RUNNING** \implies
DONE
 - ▶ Case 4: $L_z = 18.54 \cdot 2\pi$: 2561x360x2881 **QUEUED DONE**
 - ▶ Case 4: **RUN FOR 1.7 WASH-OUT** by now
 - ▶ **Step 4:** Run the L_x extensions up to $Re_\theta = 3130$. **PENDING**
 - ▶ Final Grid: 4097x386x2881

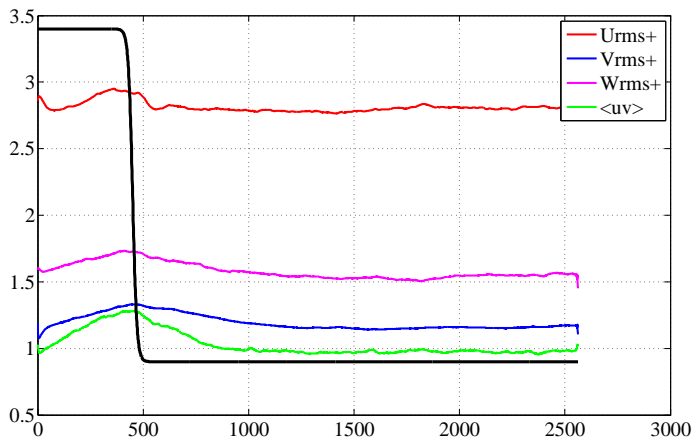
2-BL's Setup: Friction Coefficient



2-BL's Setup: Shape Factor



2-BL's Setup: Stresses for the 3th Image



2-BL's Setup: Stresses for the 3th Image

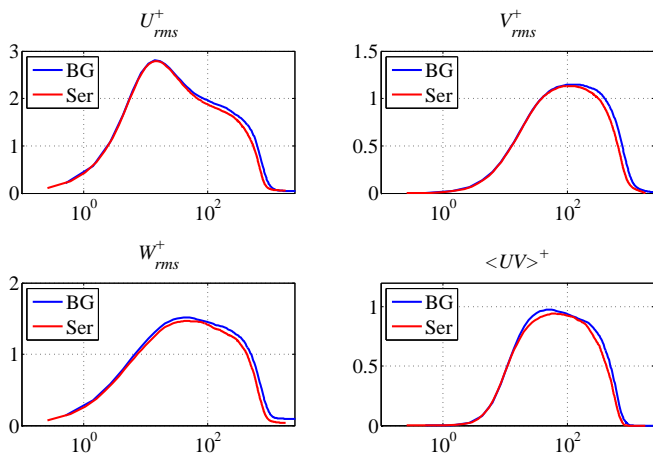


Figura: Inner Scaling. $Re_\theta = 2000$

2-BL's Setup: Stresses for the 3th Image

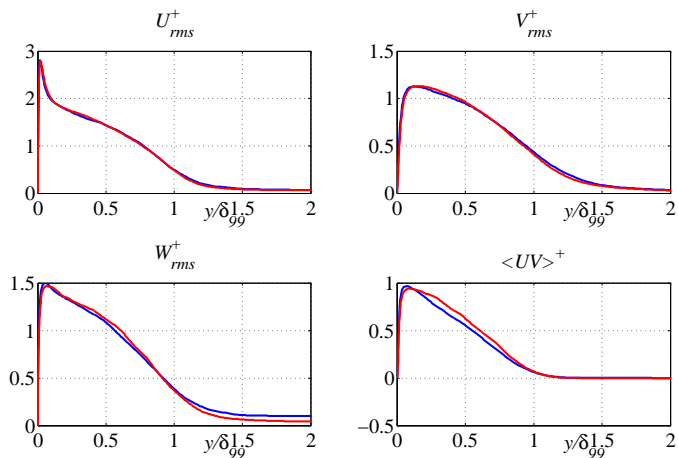
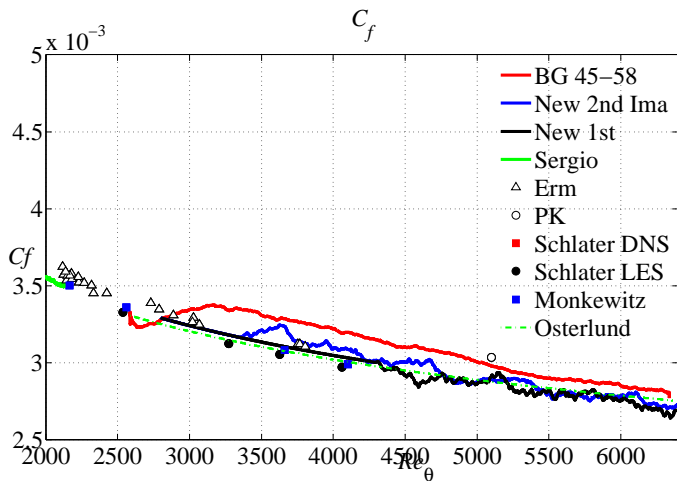


Figura: Outer Y scaling. $Re_\theta = 2000$

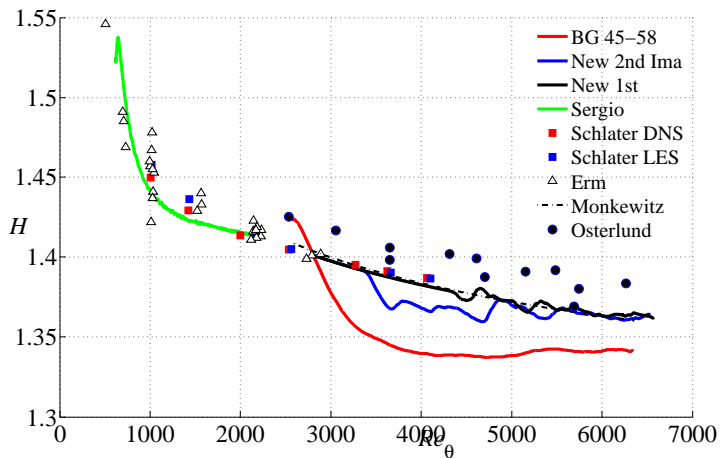
2-BL's Setup

- ▶ **BL2 Setup:** Low Resolution BL $Re_\theta = 2800 - 6250$
 - ▶ **Step 2:** Extend in L_z and Impose profiles:
 - ▶ Extend $L_z = 14.07 \cdot 2\pi \Rightarrow L_z = 18.54 \cdot 2\pi$ **DONE**
 - ▶ **Impose** profiles over the **entire box** for the first 250 steps of 2500 steps **DONE**
 - ▶ **Keep imposing** profiles over 1.5 Eddy-turn-over approx: 1850 of 7681 points **DISCARDED**
 - ▶ **Step 3: Run** the Case on 4096 Nodes **QUEUED DONE**
 - ▶ Already Run 7500 steps. **31% WASH-OUT**
 - ▶ **Step 4: Interpolate to High Resolution:**
 - ▶ Final Grid: **15361x711x2730 PENDING**
 - ▶ Runs on ≈ 25.5 sec in 7.5k Nodes

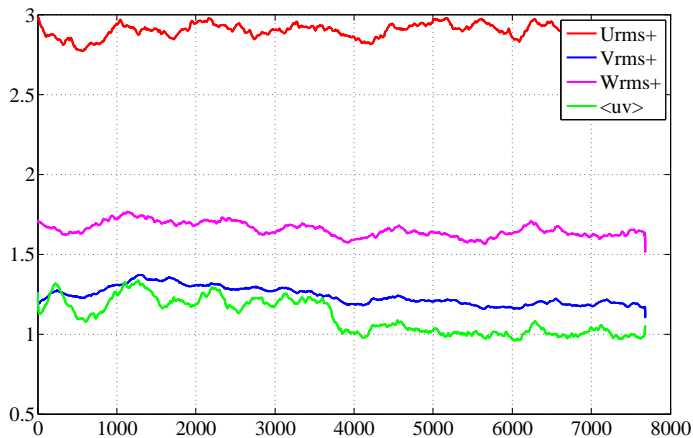
2-BL's Setup: Friction Coefficient



2-BL's Setup: Shape Factor



2-BL's Setup: Stresses



DATA TRANSFER

- ▶ I have already contacted DELFINO, TACC SUPPORT & INTREPID SUPPORT
 - ▶ **Manuel Delfino:** **STILL** Awaiting for his reply ([How to efficiently move files to Spain](#))
 - ▶ **TACC support:** Trying to **GET** the **GridFTP certificates** in their machines **DONE**
 - ▶ They have all the ANL Certificates and my "Distinguished name Certificate" (DN)
 - ▶ **Waiting** to GET GRIDFTP privileges at TACC
 - ▶ **INTREPID support:** Trying to get Permission to execute BSCP
 - ▶ They have installed in INTREPID the last BSCP version.
Working very good

DATA TRANSFER

- ▶ Transfer Rates:
 - ▶ Intrepid \implies TACC: Average **75 Mb/sec**
 - ▶ Intrepid \implies Wamba: Average **4.8 Mb/sec**
- ▶ Basic BSCP syntax:
 - ▶ **-z** Inverse Protocol; **-s** Number of Threads; **-P** sec progress messages every sec seconds
- ▶ Time stimation to transfer BG images: **520 Gb** each
 - ▶ To **TACC**: **2 hours** at 75 Mb/sec
 - ▶ To **WAMBA**: **30 hours** at 4.8 Mb/sec

DATA TRANSFER: 660 Mb File

- ▶ INTREPID \implies TACC transfer (To Ranger):
- ▶ Elapsed Time: **Around 15 sec**

```
sillero@login2:/intrepid-fs0/users/sillero/scratch/images$ bbcop -fz -s 1 -P 2 gs2.intrepid.alcf.anl.gov:/intrepid-fs0/users/sillero/scratch/images/bl-Re2800-6200-LR-par.01.080.st sillero@ranger.tacc.utexas.edu:/work/01486/sillero  
sillero@ranger.tacc.utexas.edu's password:  
  
bbcop: Warning: login3.ranger.tacc.utexas.edu is running an older version of bbcop  
bbcop: Creating /work/01486/sillero/bl-Re2800-6200-LR-par.01.080.st  
bbcop: At 101019 05:42:25 copy 12% complete; 61712.5 KB/s  
bbcop: At 101019 05:42:26 copy 31% complete; 60489.6 KB/s  
bbcop: At 101019 05:42:28 copy 40% complete; 59689.8 KB/s  
bbcop: At 101019 05:42:30 copy 55% complete; 56583.9 KB/s  
bbcop: At 101019 05:42:32 copy 71% complete; 55062.9 KB/s  
bbcop: At 101019 05:42:34 copy 79% complete; 49713.2 KB/s  
bbcop: At 101019 05:42:36 copy 97% complete; 50944.4 KB/s
```

DATA TRANSFER: 660 Mb File

- ▶ **INTREPID** \implies **WAMBA** transfer:
- ▶ Elapsed Time: **Around 2 min 20 sec**

```
-rw-rw-r-- 1 sillero users 626M 2010-10-18 13:11 bl-Re2800-6200-LR-par.01.080.st
sillero@login2:/intrepid-fs0/users/sillero/scratch/images$ bbcpc -fz -s 64 -P 5 gs2.intrepid.
alcf.anl.gov:/intrepid-fs0/users/sillero/scratch/images/bl-Re2800-6200-LR-par.01.080.st sill
ero@wamba.dmt.upm.es:/wamba17/sillero/
sillero@wamba.dmt.upm.es's password:
bbcpc: Creating /wamba17/sillero/bl-Re2800-6200-LR-par.01.080.st
bbcpc: 101019 12:33:23 1% done; 1.6 MB/s
bbcpc: 101019 12:33:28 4% done; 3.4 MB/s
bbcpc: 101019 12:33:33 8% done; 3.8 MB/s
bbcpc: 101019 12:33:38 12% done; 4.0 MB/s
bbcpc: 101019 12:33:43 16% done; 4.2 MB/s
bbcpc: 101019 12:33:48 19% done; 4.2 MB/s
bbcpc: 101019 12:33:53 23% done; 4.3 MB/s
bbcpc: 101019 12:33:58 27% done; 4.3 MB/s
bbcpc: 101019 12:34:03 31% done; 4.4 MB/s
bbcpc: 101019 12:34:08 34% done; 4.4 MB/s
bbcpc: 101019 12:34:13 38% done; 4.4 MB/s
bbcpc: 101019 12:34:18 41% done; 4.4 MB/s
bbcpc: 101019 12:34:23 45% done; 4.4 MB/s
bbcpc: 101019 12:34:28 48% done; 4.4 MB/s
bbcpc: 101019 12:34:33 52% done; 4.4 MB/s
bbcpc: 101019 12:34:38 56% done; 4.4 MB/s
bbcpc: 101019 12:34:43 59% done; 4.4 MB/s
bbcpc: 101019 12:34:48 63% done; 4.4 MB/s
bbcpc: 101019 12:34:53 67% done; 4.5 MB/s
bbcpc: 101019 12:34:58 70% done; 4.5 MB/s
bbcpc: 101019 12:35:03 74% done; 4.5 MB/s
bbcpc: 101019 12:35:08 77% done; 4.4 MB/s
bbcpc: 101019 12:35:13 81% done; 4.5 MB/s
bbcpc: 101019 12:35:18 84% done; 4.4 MB/s
bbcpc: 101019 12:35:23 87% done; 4.4 MB/s
bbcpc: 101019 12:35:28 91% done; 4.4 MB/s
bbcpc: 101019 12:35:33 95% done; 4.4 MB/s
bbcpc: 101019 12:35:38 99% done; 4.4 MB/s
```


DATA TRANSFER: Where the connection are done?

- ▶ Wamba & Intrepid are under **firewalls**: Reject direct ORIGIN ⇒ DESTINATION connections to port **5031**
- ▶ With **Inverse Protocol**: Connection to **port 22** (like ssh) at Origin
- ▶ Use **DATA TRANSFER NODES** at Intrepid:
gs2.intrepid.alcf.anl.gov

DATA TRANSFER: Where the connection are done?

- ▶ **OPEN CONNECTION** using Inverse Protocol
 - ▶ **First:** Wamba connect to Data Transfer Node using port 22
 - ▶ **Finally:** Data Transfer Node connect to Login Node

```
sillero@wamba:~$ lsof -i -P
COMMAND  PID  USER  FD  TYPE  DEVICE  SIZE/OFF  NODE NAME
MATLAB   25572 sillero  3u  IPv6  691577      0t0  TCP localhost:58066->localhost:6012 (ESTABLISHED)
MATLAB   25572 sillero 197u IPv6  691589      0t0  TCP localhost:58067->localhost:6012 (ESTABLISHED)
MATLAB   25572 sillero 207u IPv6  691601      0t0  TCP localhost:58068->localhost:6012 (ESTABLISHED)
bbcp     28494 sillero  3r  IPv4  709164      0t0  TCP wamba.dmt.upm.es:33163->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero  4u  IPv4  709302      0t0  TCP wamba.dmt.upm.es:33165->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero  5u  IPv4  709301      0t0  TCP wamba.dmt.upm.es:33164->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero  6u  IPv4  709304      0t0  TCP wamba.dmt.upm.es:33167->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero  7u  IPv4  709303      0t0  TCP wamba.dmt.upm.es:33166->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero  8u  IPv4  709306      0t0  TCP wamba.dmt.upm.es:33169->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero  9u  IPv4  709307      0t0  TCP wamba.dmt.upm.es:33170->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero 10u  IPv4  709305      0t0  TCP wamba.dmt.upm.es:33168->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero 11u  IPv4  709310      0t0  TCP wamba.dmt.upm.es:33173->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero 12u  IPv4  709308      0t0  TCP wamba.dmt.upm.es:33171->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
bbcp     28494 sillero 13u  IPv4  709311      0t0  TCP wamba.dmt.upm.es:33174->gs2.intrepid.alcf.anl.gov:50000 (ESTABLISHED)
```

```
sillero@login2:/intrepid-fs0/users/sillero/scratch$ lsof -i -P
COMMAND  PID  USER  FD  TYPE  DEVICE  SIZE/OFF  NODE NAME
ssh       20376 sillero  3u  IPv4  8083552      TCP login2.intrepid.alcf.anl.gov:45848->gs2.intrepid.alcf.anl.gov:22 (ESTABLISHED)
ssh       20379 sillero  4u  IPv4  8083571      TCP login2.intrepid.alcf.anl.gov:40078->wamba.dmt.upm.es:22 (ESTABLISHED)
ssh       20393 sillero  3u  IPv4  8083675      TCP login2.intrepid.alcf.anl.gov:45882->gs2.intrepid.alcf.anl.gov:22 (ESTABLISHED)
ssh       20395 sillero  4u  IPv4  8083689      TCP login2.intrepid.alcf.anl.gov:40110->wamba.dmt.upm.es:22 (ESTABLISHED)
ssh       20410 sillero  3u  IPv4  8083825      TCP login2.intrepid.alcf.anl.gov:45926->gs2.intrepid.alcf.anl.gov:22 (ESTABLISHED)
ssh       20413 sillero  4u  IPv4  8083839      TCP login2.intrepid.alcf.anl.gov:40154->wamba.dmt.upm.es:22 (ESTABLISHED)
ssh       31190 sillero  3u  IPv4  6723092      TCP login2.intrepid.alcf.anl.gov:50678->gs2.intrepid.alcf.anl.gov:22 (ESTABLISHED)
ssh       31192 sillero  4u  IPv4  6723107      TCP login2.intrepid.alcf.anl.gov:52731->login3.ranger.tacc.utexas.edu:22 (ESTABLISHED)
```

DATA TRANSFER: Where the connection are done?

- ▶ **CLOSE CONNECTION** using Direct Protocol
 - ▶ Login Node **connect** to Data Transer Node
 - ▶ Data Transer Node **TRY** to connect to Wamba port 5031
 - ▶ Wamba try to listen for port 5031 which is closed by the **FIREWALL**

```
sillero@login2:/intrepid-fs0/users/sillero/scratch$ lsof -i -P
COMMAND  PID  USER  FD  TYPE  DEVICE  SIZE  NODE  NAME
ssh      20376 sillero  3u  IPv4  8083552  TCP  login2.intrepid.alcf.anl.gov:45848->gs2.intrepid.alcf.anl.gov:22 (ESTABLISHED)
ssh      20379 sillero  4u  IPv4  8083571  TCP  login2.intrepid.alcf.anl.gov:40078->wamba.dmt.upm.es:22 (CLOSE_WAIT)
ssh      20393 sillero  3u  IPv4  8083675  TCP  login2.intrepid.alcf.anl.gov:45882->gs2.intrepid.alcf.anl.gov:22 (ESTABLISHED)
ssh      20395 sillero  4u  IPv4  8083689  TCP  login2.intrepid.alcf.anl.gov:40110->wamba.dmt.upm.es:22 (CLOSE_WAIT)
ssh      20410 sillero  3u  IPv4  8083825  TCP  login2.intrepid.alcf.anl.gov:45926->gs2.intrepid.alcf.anl.gov:22 (ESTABLISHED)
ssh      20413 sillero  4u  IPv4  8083839  TCP  login2.intrepid.alcf.anl.gov:40154->wamba.dmt.upm.es:22 (ESTABLISHED)
ssh      31190 sillero  3u  IPv4  6723092  TCP  login2.intrepid.alcf.anl.gov:50678->gs2.intrepid.alcf.anl.gov:22 (ESTABLISHED)
ssh      31192 sillero  4u  IPv4  6723107  TCP  login2.intrepid.alcf.anl.gov:52731->login3.ranger.tacc.utexas.edu:22 (ESTABLISHED)

sillero@wamba:~$ lsof -i -P
COMMAND  PID  USER  FD  TYPE  DEVICE  SIZE/OFF  NODE  NAME
MATLAB   25572 sillero  3u  IPv6  691577  0t0  TCP  localhost:58066->localhost:6012 (ESTABLISHED)
MATLAB   25572 sillero  197u IPv6  691589  0t0  TCP  localhost:58067->localhost:6012 (ESTABLISHED)
MATLAB   25572 sillero  207u IPv6  691601  0t0  TCP  localhost:58068->localhost:6012 (ESTABLISHED)
bbcp     28769 sillero  3r  IPv4  710101  0t0  TCP  *:5031 (LISTEN)
```