

Optics update, toward V0.2

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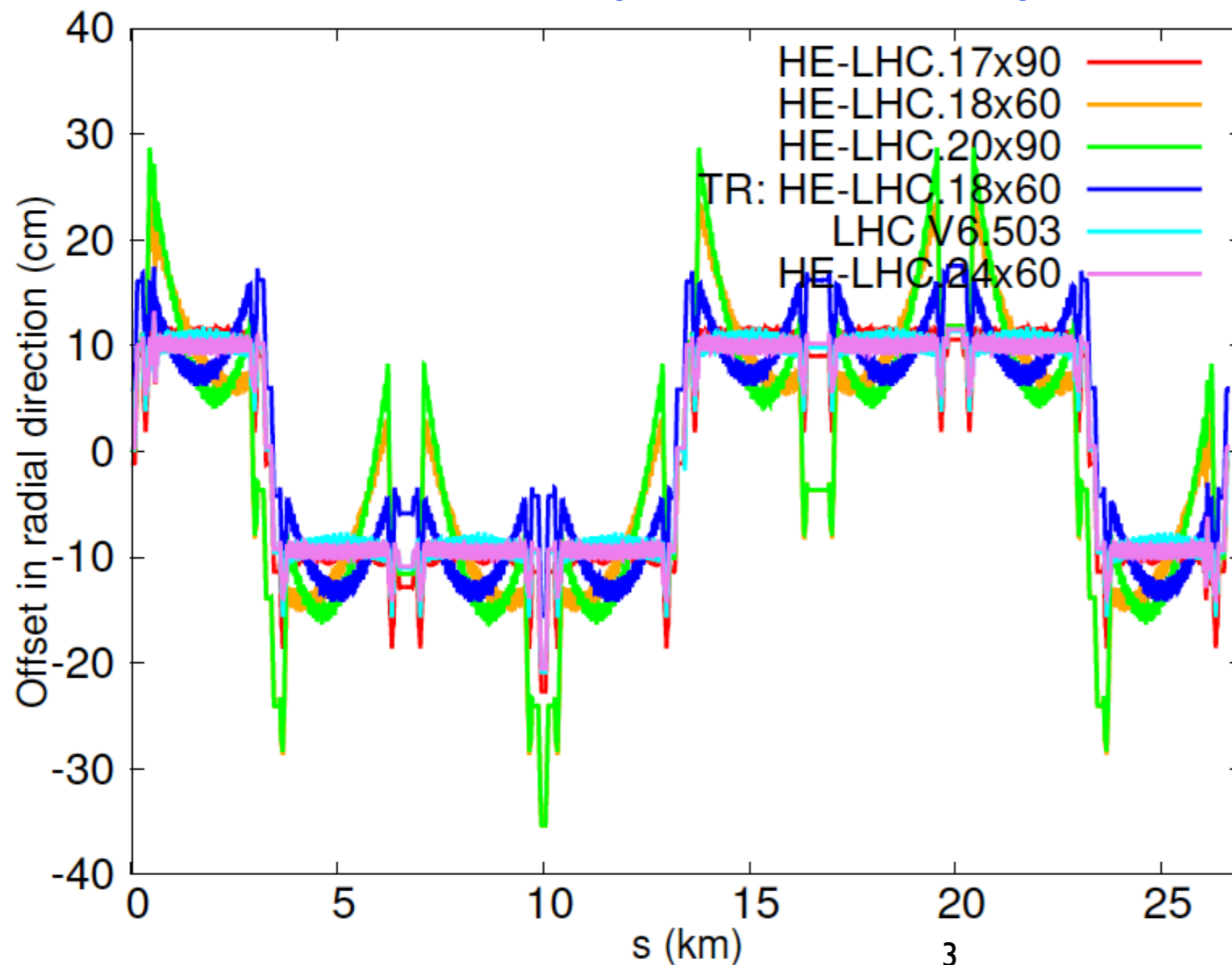
Outline

- **Geometry update**
- **Sequence files**

1. Geometry update

➤ Compare the survey of LEP and (HE-)LHC

- Ring separation at arcs: $b_{sep} = 204$ mm
- Path length difference due to ring separation is corrected
- Mathematica script written to implement “DS” and clean file



NOTE:

- 1) Now all sequence files has closed survey!
- 2) Good ring geometry for 17x90, 18x60 and 18x90
- 3) 20x90 to be improved

2. Sequence files

➤ HE-LHC repository

- [/afs/cern.ch/eng/lhc/optics/HELHC/](#)
- see **README** file for basic information

```
-rw-r--r-- .1 dezhou def-cg 287333 0ct 26 15:35 merged_HE-LHC.17x90_tr.rev.seq  
-rw-r--r-- .1 dezhou def-cg 278798 0ct 26 15:35 merged_HE-LHC.18x60_tr.rev.seq  
-rw-r--r-- .1 dezhou def-cg 293631 0ct 26 15:36 merged_HE-LHC.18x60_v102.rev.seq  
-rw-r--r-- .1 dezhou def-cg 307289 0ct 26 15:37 merged_HE-LHC.20x90_v201.rev.seq
```

2. Sequence files

➤ Example of merged_HE-LHC.18x60_tr.rev.seq

```
real const pIP1      = 0;
real const pIP2      = 3332.3604;
... ..
... ..

! inner-outer path length differences in main bends
ds      = bsep/2 * twopi/1280;
sumds = 0;

mynewhelhcb1: sequence, l = 26658.883200000;
ip1, at = sumds + 0.000000000;
mbas2.1r1, at = sumds + 1.500000000;
... ..
nds, at = sumds + 275.630526004 + 0.5*ds; sumds = sumds + ds;
nds, at = sumds + 291.090526004 + 0.5*ds; sumds = sumds + ds;
... ..
b, at = sumds + 442.305461393 + 0.5*ds; sumds = sumds + ds;
b, at = sumds + 457.765461393 + 0.5*ds; sumds = sumds + ds;
b, at = sumds + 473.225461393 + 0.5*ds; sumds = sumds + ds;
b, at = sumds + 488.685461393 + 0.5*ds; sumds = sumds + ds;
... ..
e.ds.r1.b1, at = sumds + 569.979767561+pIP1;
... ..
ip1.l1, at = sumds + 26658.883200000;
endsequence;
```

3. Summary

➤ Ring geometry

- Already have good geometry for 17x90, 18x60 and 18x90 lattices
- Need further improvements to better fit the LEP survey? Or tunnel survey?
- Geometry for 20x90 to be improved (Not urgent?)