Optics update

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Outline
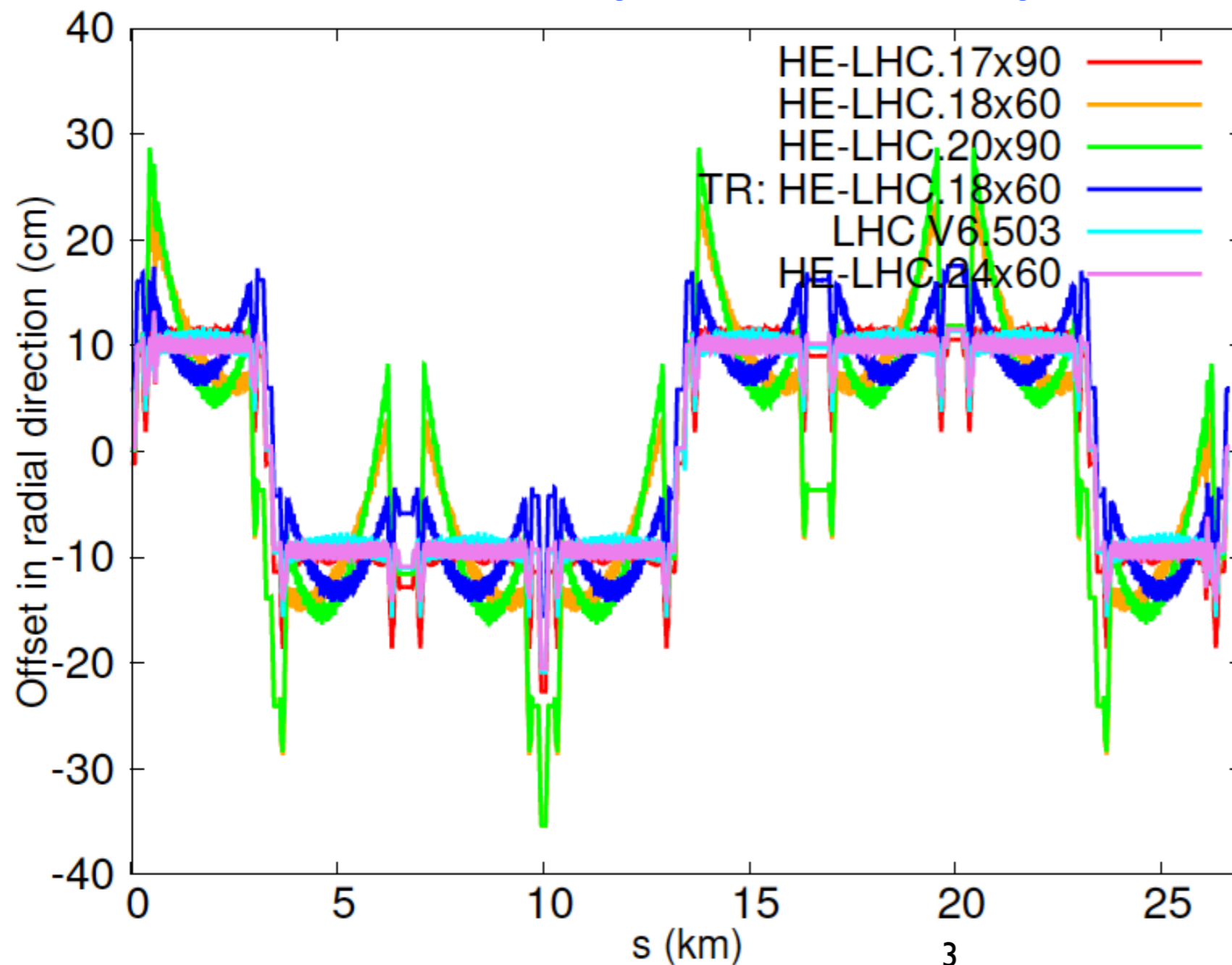
➤ **Geometry update**

➤ **Sequence files**

1. Geometry update

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

- **Ring separation at arcs: bsep = 204 mm**
- **Path length difference due to ring separation is corrected**
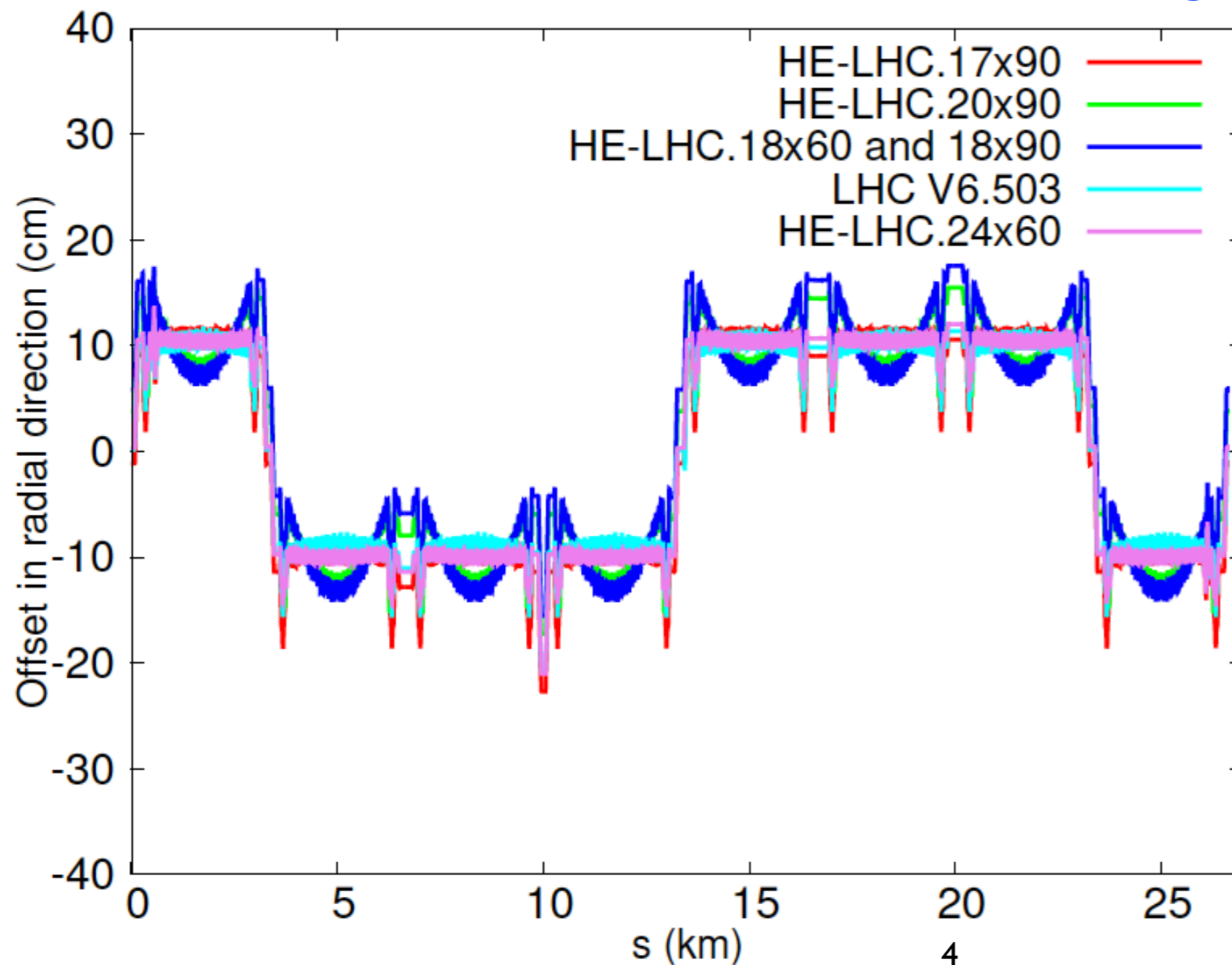- **Mathematica script written to implement "DS" and clean file**

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

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1. Geometry update

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

- **Ring separation at arcs: bsep = 204 mm**
- **Path length difference due to ring separation is corrected**
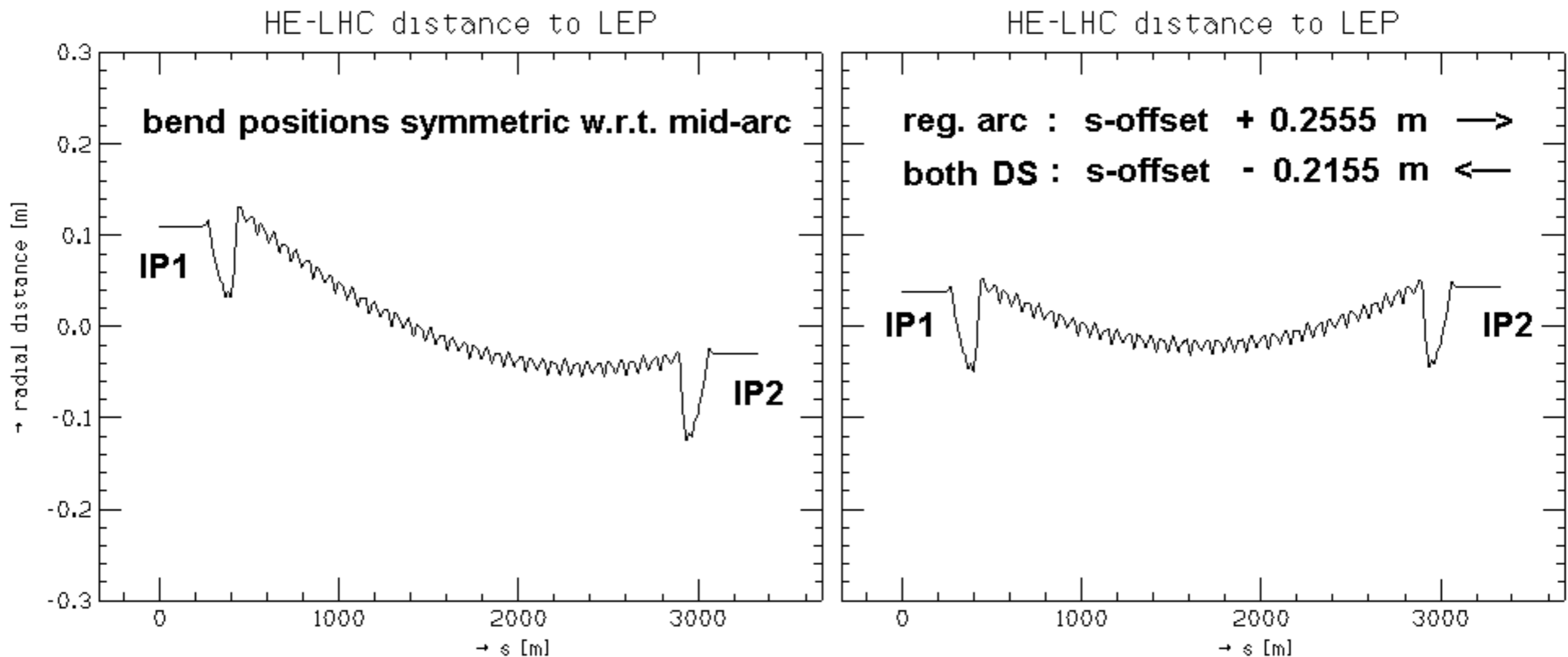- **HE-LHC 20x90: Shift arcs for better fitting**

NOTE:

1) **Maximum offset in radial direction: <~11cm comparing to LEP survey**

2) **Good ring geometry for all candidates**

1. Geometry update

➤ Message from Thys

● **The bends in the two dispersion suppressors are moved to one side, and the bends in the regular arc cells to the other side. And in the next octant it is done the other way round.**

● **Peak-to-peak offset 3.4 cm for the 17x90 lattice**

2. Sequence files

➤ **Sequence files towards V0.3**
- **/afs/cern.ch/eng/lhc/optics/HELHC/**
- **Proposed sequence for HE-LHC V0.3:**
  merged_HE-LHC.18x60_tr.s*
  NOTE: repository might be re-structured and files renamed!
Check the README files for update!

```
-rw-r--r--. 1 riss    si    168    10066 Nov 13 16:37 merged_HE-LHC.18x60_tr.str
-rw-r--r--. 1 riss    si    169    10292 Nov 13 16:02 merged_HE-LHC.17x90_tr.str
-rw-r--r--. 1 riss    si    170    10161 Nov 13 14:06 merged_HE-LHC.20x90_tr.str
-rw-r--r--. 1 riss    si    171    10064 Nov 13 13:51 merged_HE-LHC.24x60.tr.str
-rw-r--r--. 1 riss    si    172   371980 Nov 13 09:41 merged_HE-LHC.24x60.seq
-rw-r--r--. 1 riss    si    173   351123 Nov 13 09:32 merged_HE-LHC.20x90_tr.seq
-rw-r--r--. 1 riss    si    174   366174 Nov 13 09:31 merged_HE-LHC.17x90_tr_v002.seq
-rw-r--r--. 1 riss    si    175   333544 Nov 11 17:12 merged_HE-LHC.18x60_tr.seq
```

2. Sequence files

➤ **HE-LHC V0.2 (by M. Hofer) based on 18x90 arc scheme:**

- **/afs/cern.ch/eng/lhc/optics/HELHC/V0.2**

```
drwxrwxrwx. 2 mihofer def-cg    2048 Nov  7 21:42 aperture
-rw-rw-rw-. 1 mihofer def-cg  361797 Nov  6 14:21 helhc_18x90.seq
-rw-rw-rw-. 1 mihofer def-cg 1519959 Nov  6 14:15 helhc_18x90_thin.seq
-rw-rw-rw-. 1 mihofer def-cg     546 Nov  6 12:16 job_sample_aperture.madx
-rw-rw-rw-. 1 mihofer def-cg     411 Nov  6 12:17 job_sample.madx
-rw-rw-rw-. 1 mihofer def-cg     426 Nov  6 12:16 job_sample_thin.madx
drwxrwxrwx. 2 mihofer def-cg    2048 Nov  7 21:46 optics
drwxrwxrwx. 2 mihofer def-cg    2048 Nov  7 21:47 toolkit
```

```
-rw-rw-rw-. 1 mihofer def-cg 12393 Nov  6 14:21 opt_coll.str
-rw-rw-rw-. 1 mihofer def-cg 11325 Nov  6 14:15 opt_coll_thin.str
-rw-rw-rw-. 1 mihofer def-cg 12393 Nov  6 14:21 opt_inj.str
-rw-rw-rw-. 1 mihofer def-cg 11325 Nov  6 14:15 opt_inj_thin.str
-rw-rw-rw-. 1 mihofer def-cg  1113 Nov  6 11:00 opt_ir4_inj.str
```

3. Summary

➤ Ring geometry

● **Already have good geometry for 17x90, 18x90 (equal to 18x60) and 20x90 lattices**

➤ Sequence files

● **V0.2 ready for users**

● **V0.3 to be prepared for HE-LHC review meeting (Dec. 11-12, 2017)?**