

Aperture Model from LHC Functional Database (FDB)

■ Reminder: LOC meeting of 11 Oct 2005:

- FDB now gives aperture markers for start end end of every vacuum chamber and beam screen in a “MAD” format
 - Aperture class definitions followed by Sequence editing blocks
 - Some missing aperture classes, etc.
 - Details send to SC
 - Comparison with collimation aperture under way

■ Differences in FDB since then:

- Data has changed but similar problems remain
- New versions of the CSV files available

■ Comparison with Collimation Study aperture

- Complete for Ring 1, not defined for Ring

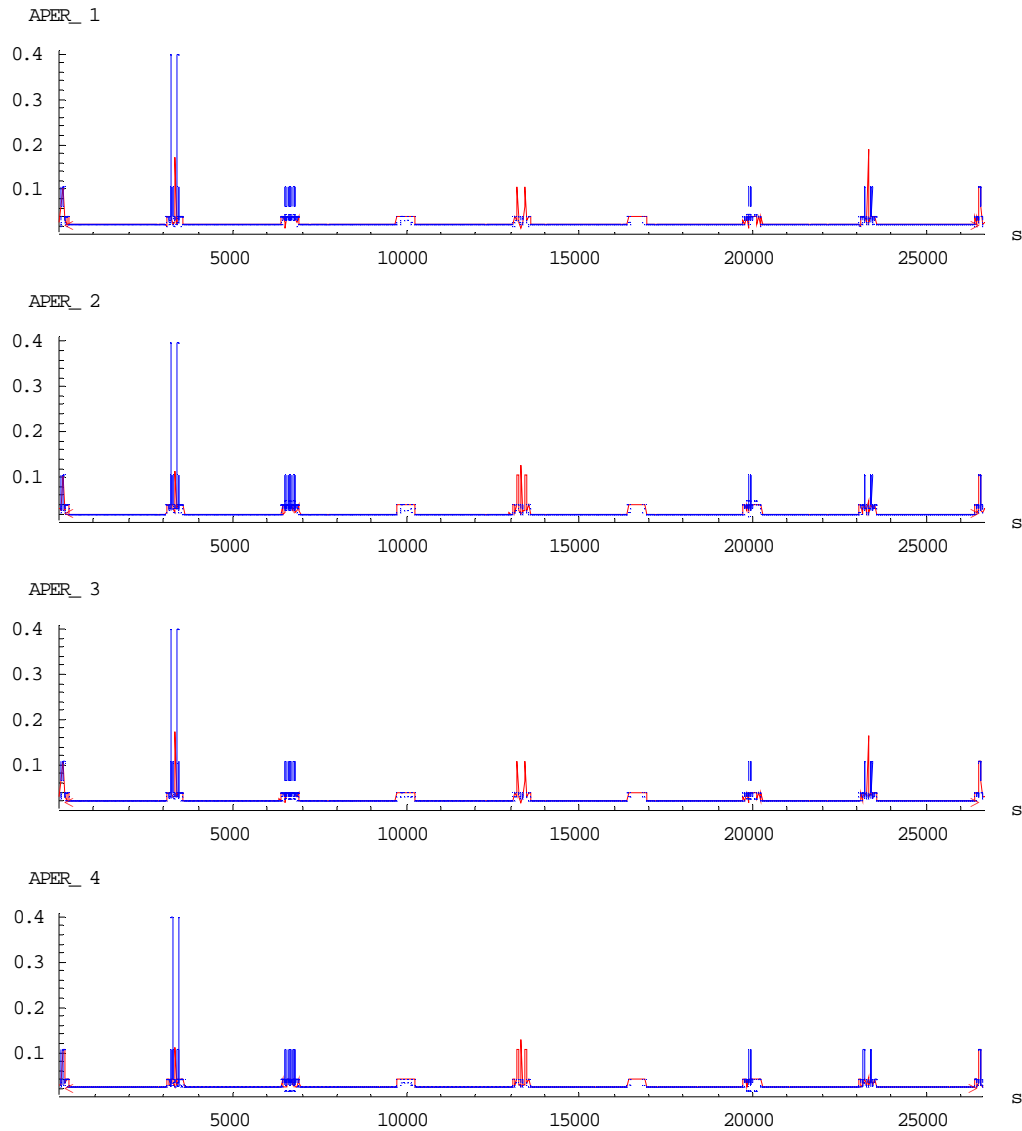
Identifying Beam Pipes

- Markers indicating start and end of pipes are not ordered
 - Many zero-length “pipes”
 - Algorithm to match them up according to names (“.S.”->“.E.”)
 - Undefined apertures discarded
 - Incomplete RECTELLIPSE data assumed to indicate elliptical chambers
 - No unmatched markers left
 - Some tapered beam pipes (ends have different apertures)
 - Some of these are “complex” tapers (ends have different shapes)

Interpretation of the plots that follow

- The following slides show a comparison between the aperture of pipes in LHCB1 (blue) extracted from the FDB and the continuous extension of the Collimation model (red).
 - The 4 components of the MAD-X RECTELLIPSE are shown (units of metre).
 - Where only a blue line appears, the two sources agree.
 - Where only a red line appears, there is a gap between pipes extracted from the FDB.
 - Where two lines appear, there is a disagreement between the two sources.
 - All the information is available numerically too, of course.

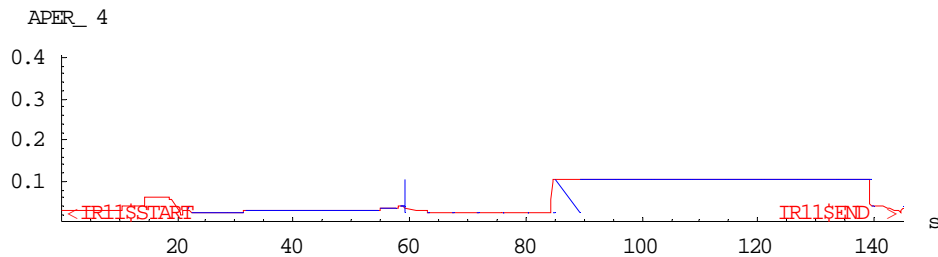
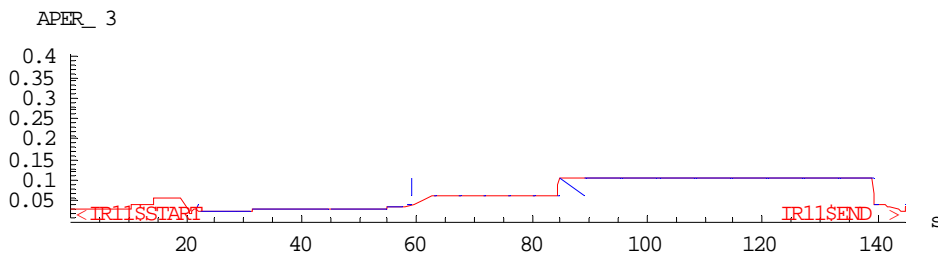
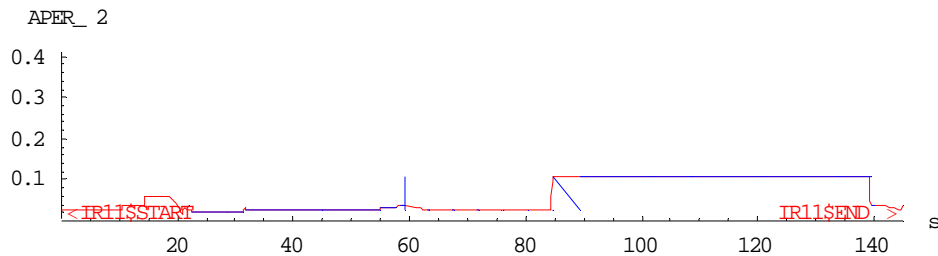
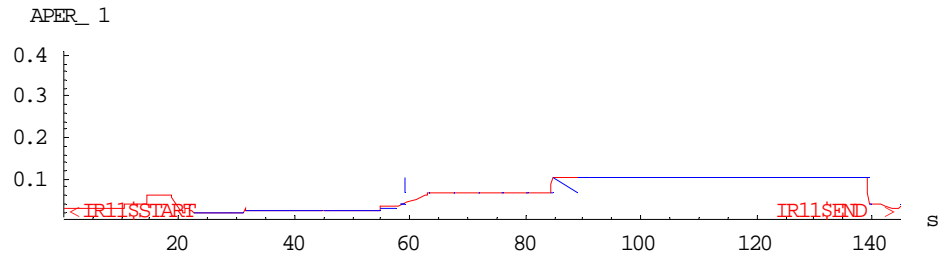
Global view of LHCb1



Blue=Latest data from FDB (not defined everywhere)

Red=Collimation Study Aperture interpolated to all points

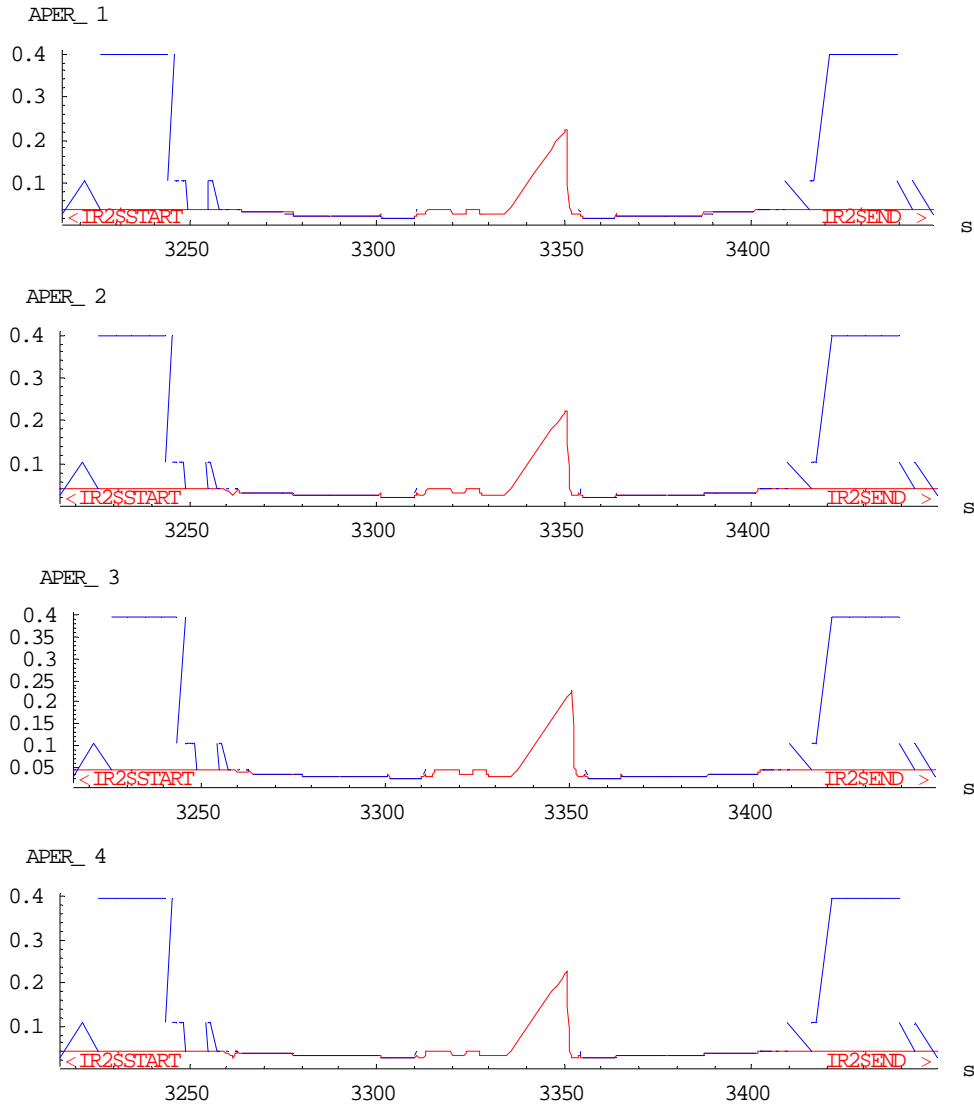
LHC module IR11 in LHCb1



Blue=Latest data from FDB (not defined everywhere)

Red=Collimation Study Aperture interpolated to all points

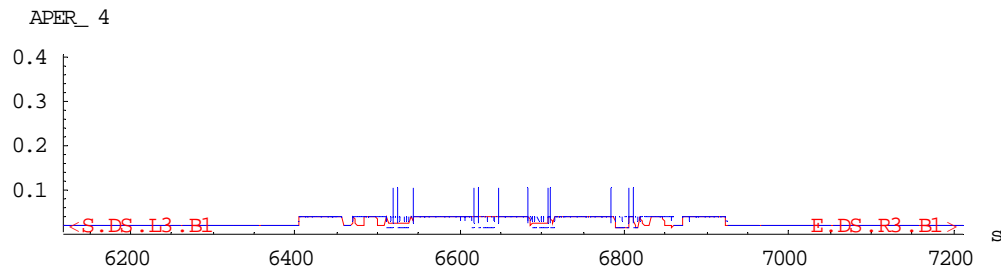
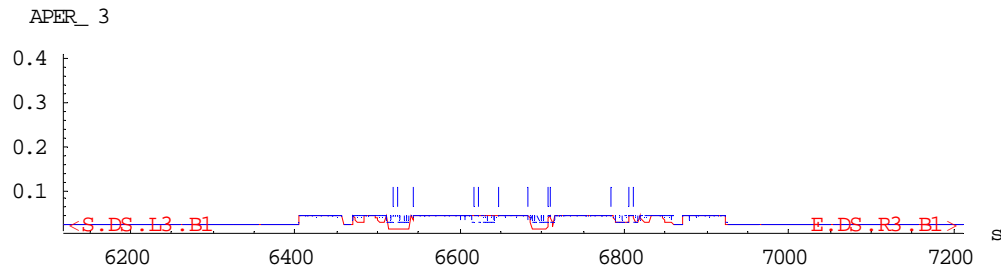
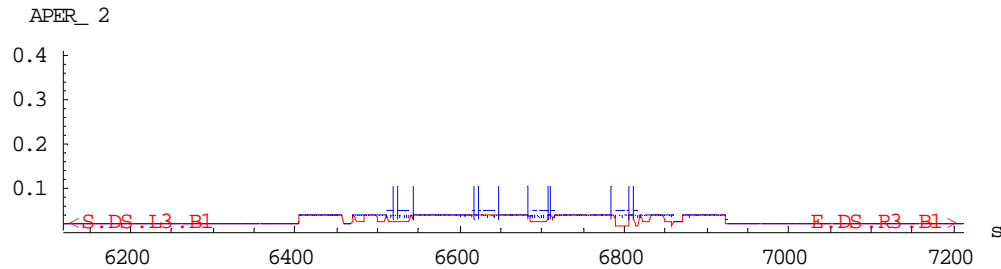
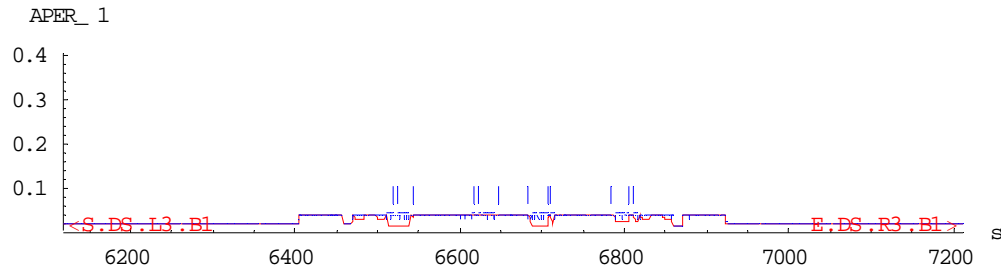
LHC module IR2 in LHCb1



Blue=Latest data from FDB (not defined everywhere)

Red=Collimation Study Aperture interpolated to all points

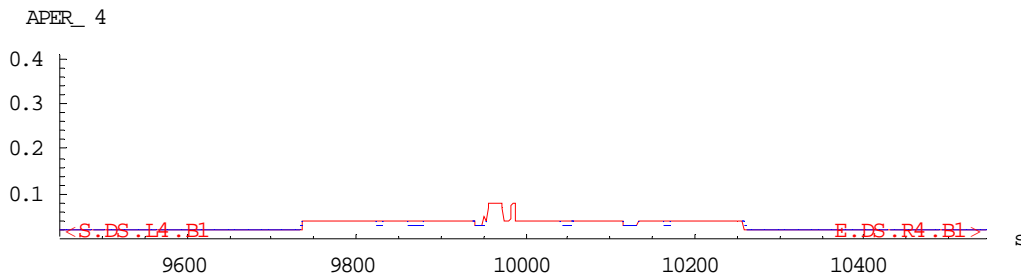
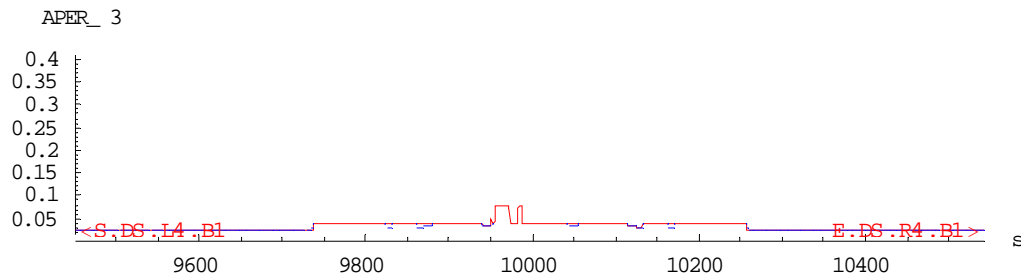
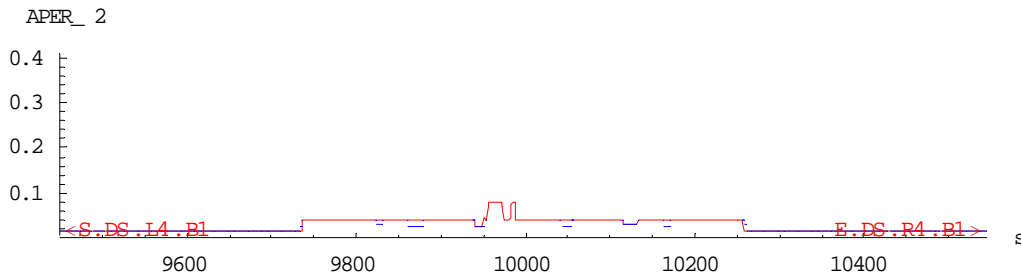
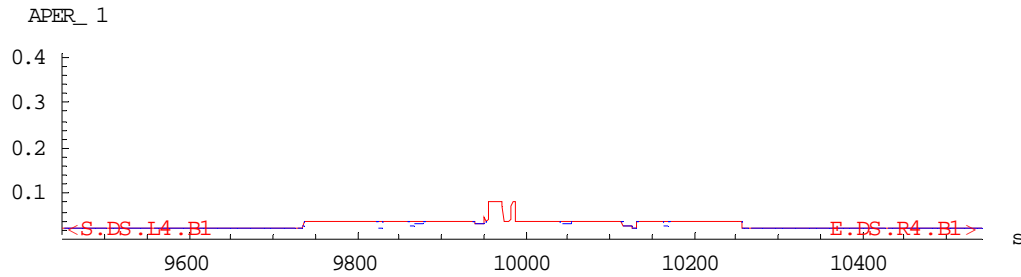
LHC module LHCmodule["DS.L3.B1","DS.R3.B1"]in LHCB1



blue=Latest data from DB (not defined everywhere)

red=Collimation Study aperture interpolated to all points

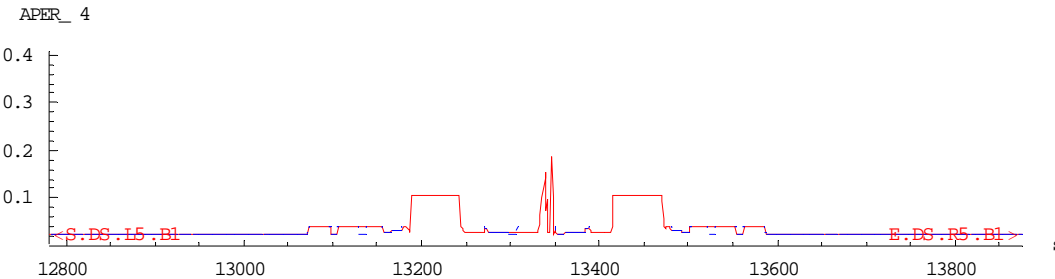
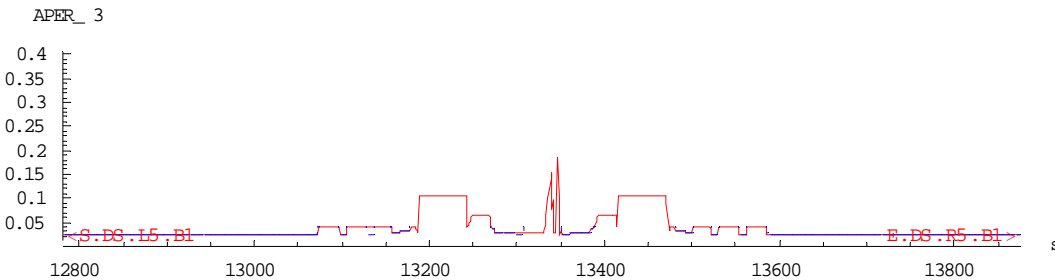
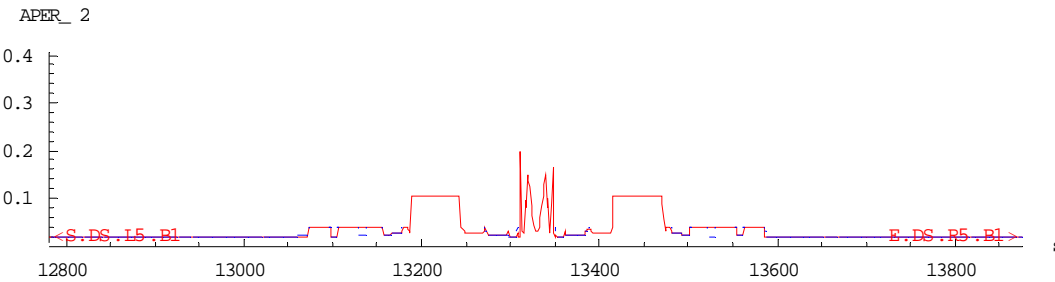
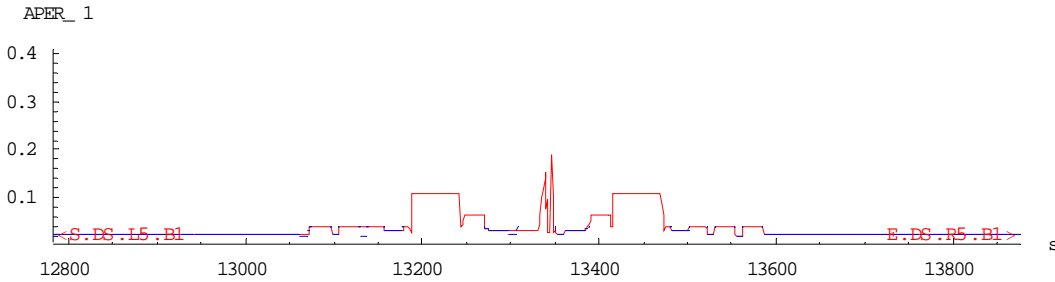
LHC module LHCmodule["DS.L4.B1","DS.R4.B1"]in LHCB1



Blue=Latest data from FDB (not defined everywhere)

Red=Collimation Study Aperture interpolated to all points

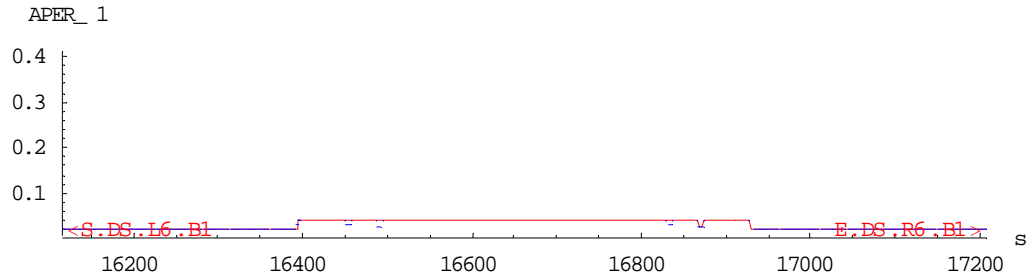
LHC module LHCmodule["DS.L5.B1", "DS.R5.B1"] in LHCB1



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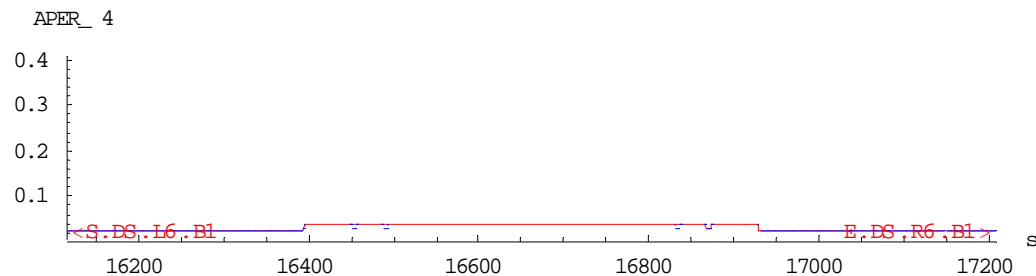
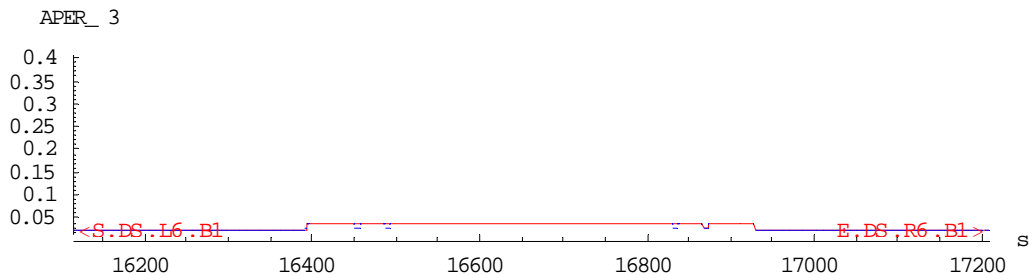
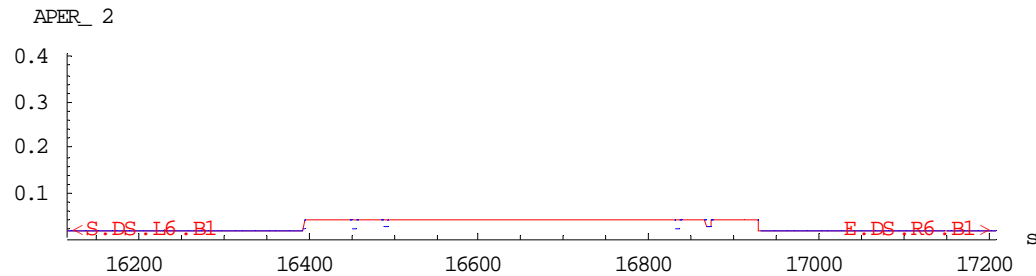
Red=Collimation Study Aperture interpolated to all points

LHC module LHCmodule["DS.L5.B1","DS.R5.B1"] in LHCB1

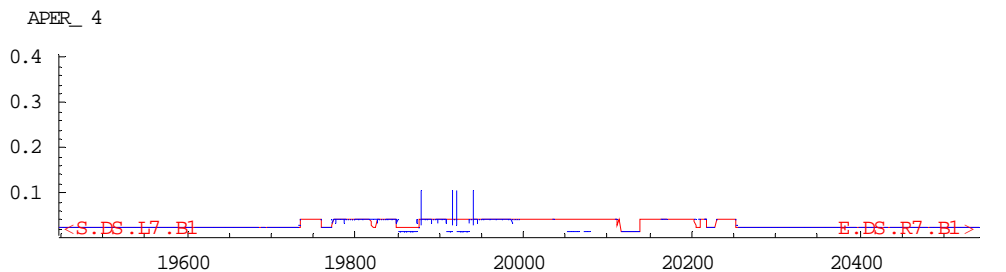
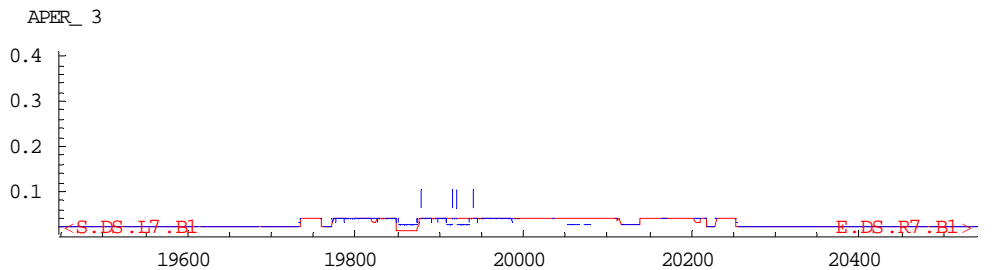
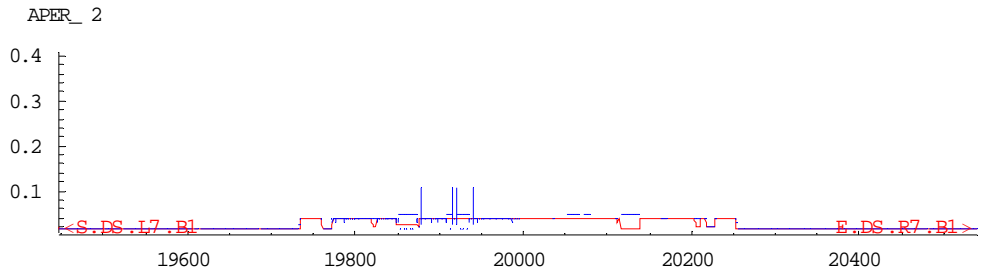
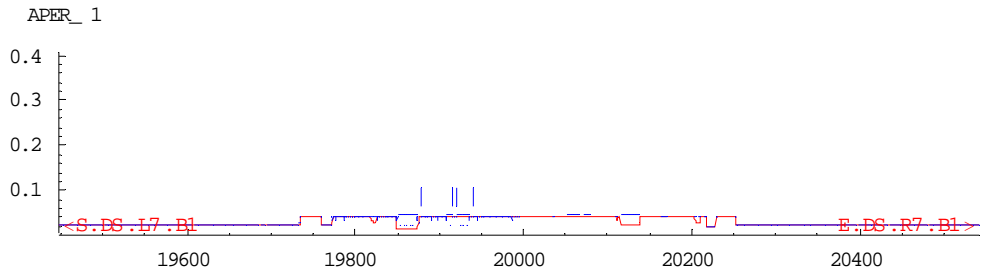


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Red=Collimation Study Aperture interpolated to all points



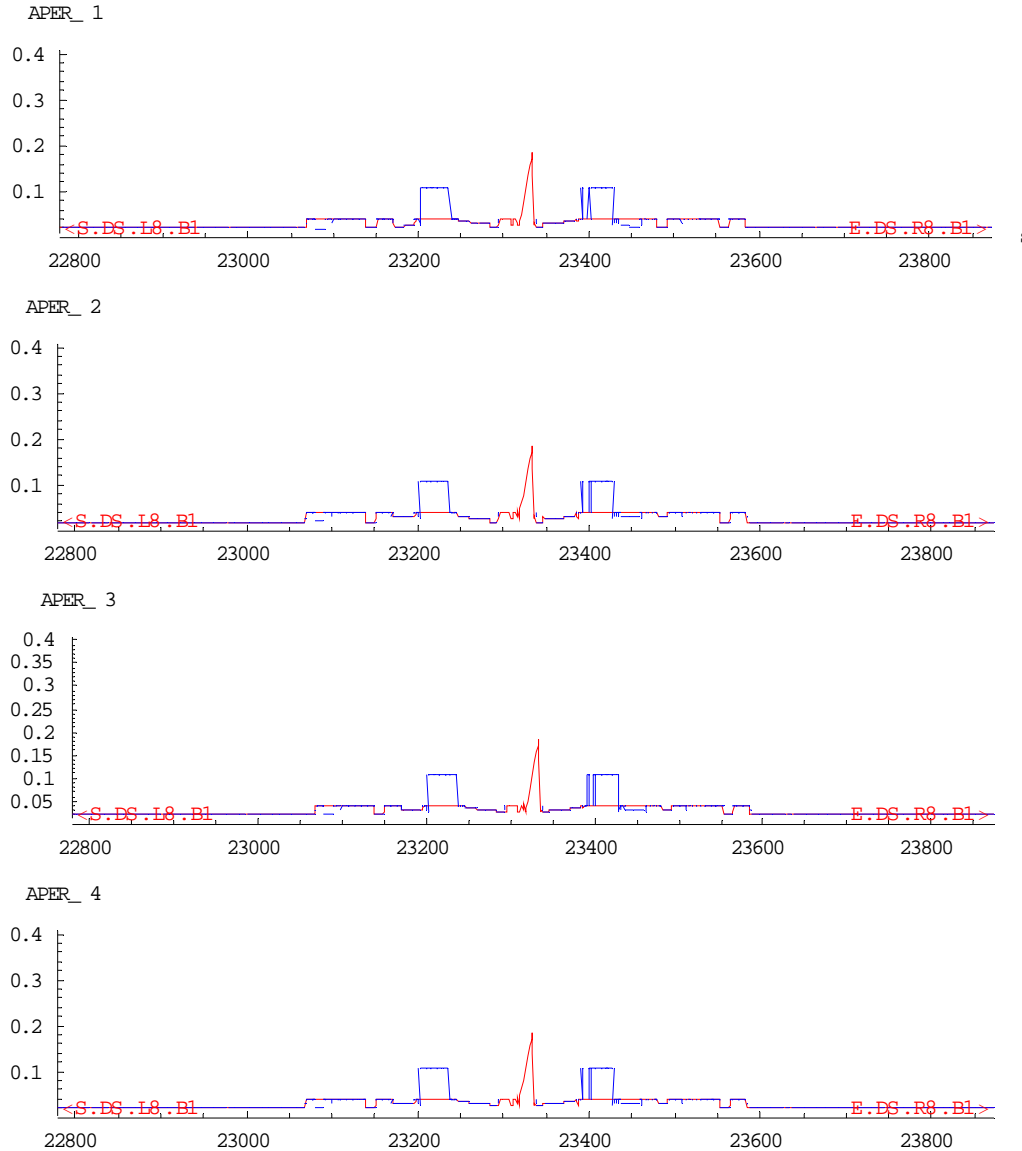
LHCmodule["DS.L7.B1", "DS.R7.B1"] in LHCb1



ie=Latest data from
B (not defined
everywhere)

d=Collimation Study
erture interpolated to
points

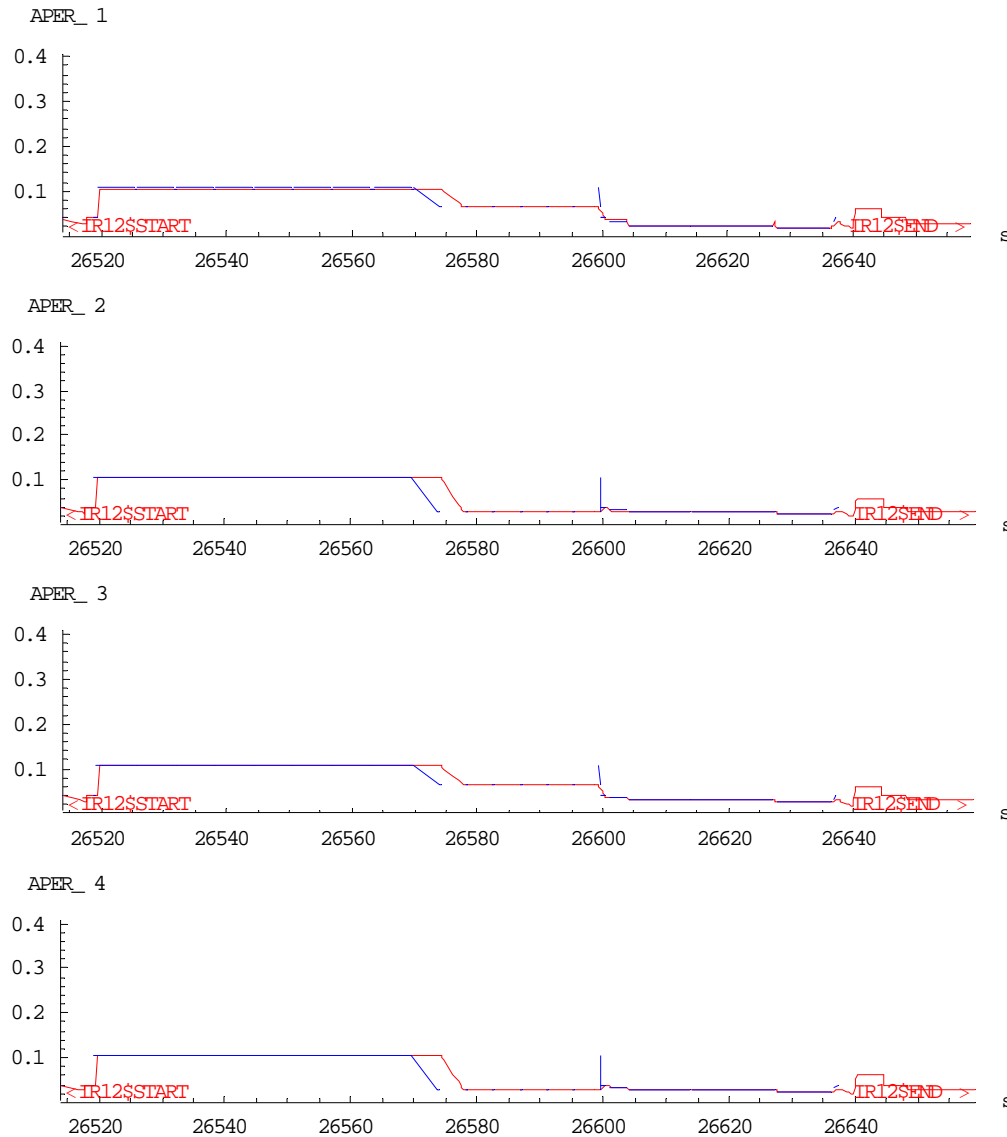
LHCmodule["DS.L8.B1", "DS.R8.B1"] in LHCB1



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Red=Collimation Study Aperture interpolated to all points

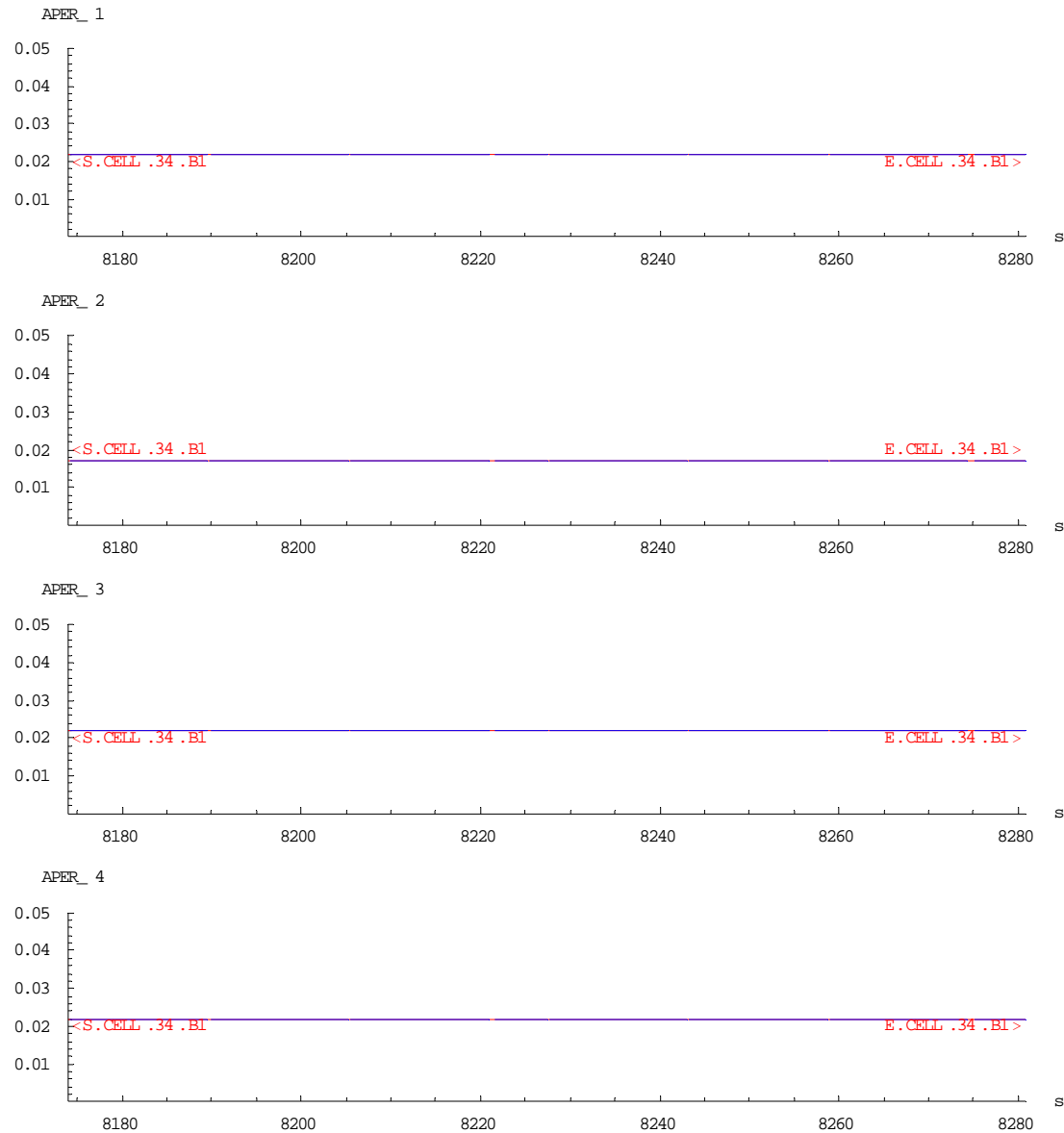
LHC module IR12 in LHCB1



ue=Latest data from
DB (not defined
everywhere)

ed=Collimation Study
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l points

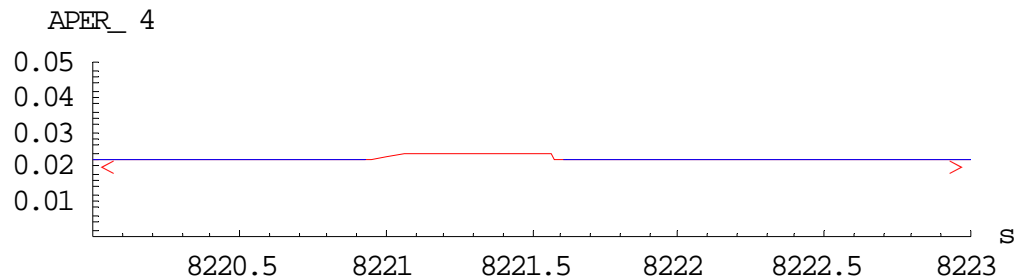
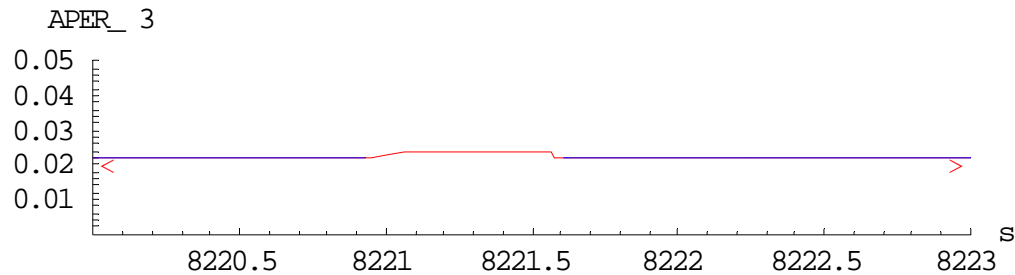
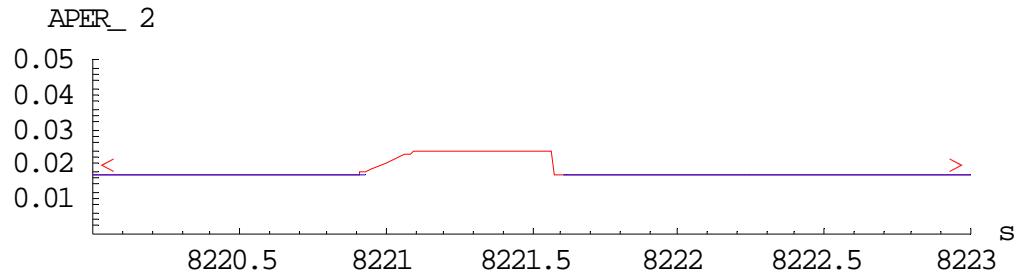
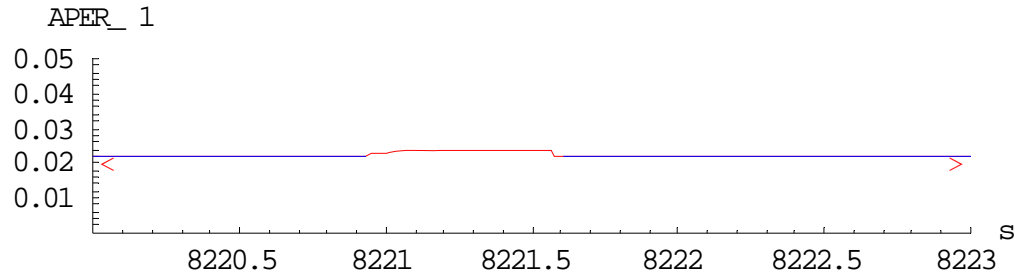
LHC module LHCmodule["CELL.34.B1"] in LHCb1



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Zoom on BPM in LHCmodule["CELL.34.B1"] in LHCB1



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