

Hierarchy-Constraints Patch Validation

Additional Information on the Parameter Comparison

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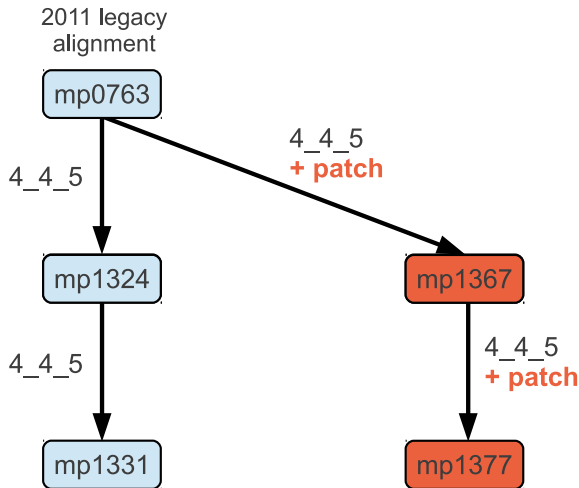
DESY

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HELMHOLTZ
| GEMEINSCHAFT

Validation Strategy

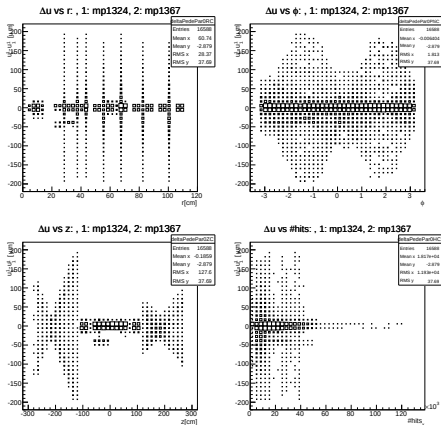


- Iterations of 2011 legacy-alignment reproduced using patched CMSSW_4_4_5
- Comparison of resulting parameters with CompareMillePede tool

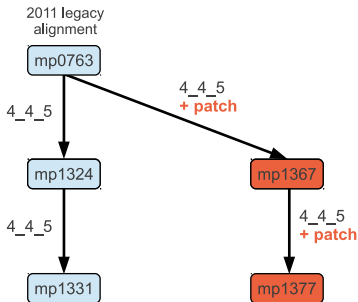
See [presentation by Andrii](#) in last CMS Tracker-Alignment Meeting

Parameter-Comparison Results

0th iteration: mp1324 vs mp1367



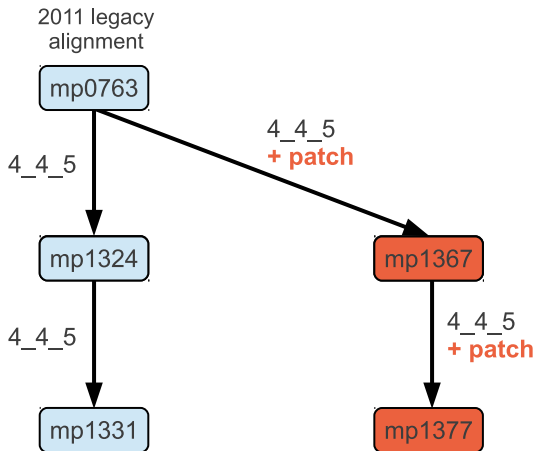
- $\text{RMS}(\Delta u) \approx 40 \mu\text{m}$



- Differences of parameter values after 0th iteration (mp1324 vs mp1367) with RMS of several $10 \mu\text{m}$
- Same size after 1st iteration (mp1331 vs mp1377)
- $< 10 \mu\text{m}$ after 2nd iteration

Additional Information on the CompareMillePede Tool

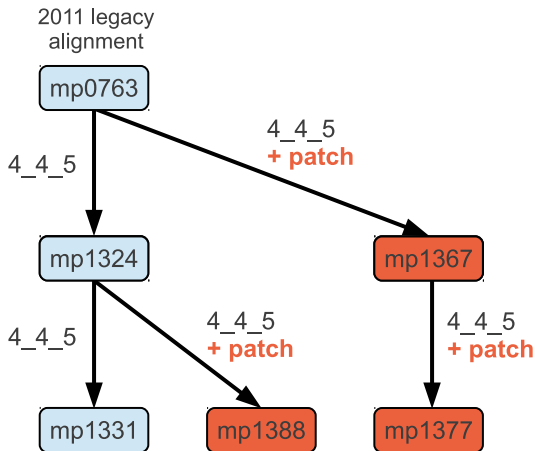
- CompareMillePede tool compares absolute parameter values
- **Implicit dependence on starting geometry!**



- In case of 1st iteration (mp1331 vs mp1377), some part of difference possibly due to different starting geometries (also the case for 2nd iteration)

Additional Information on the CompareMillePede Tool

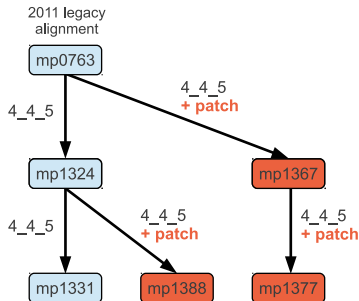
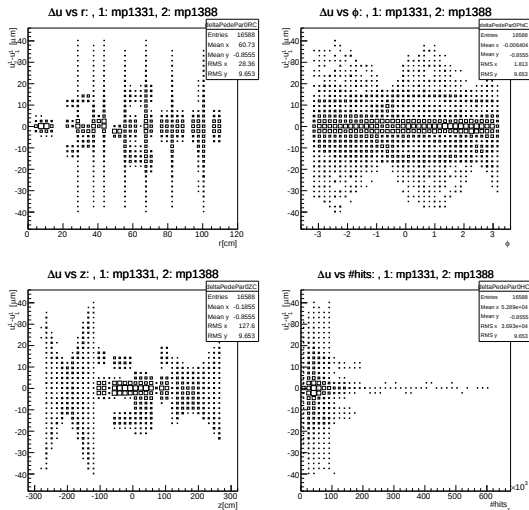
- CompareMillePede tool compares absolute parameter values
- **Implicit dependence on starting geometry!**



- In case of 1st iteration (mp1331 vs mp1377), some part of difference possibly due to different starting geometries (also the case for 2nd iteration)
- Run patch directly on mp1324

1st Iteration with same Starting Geometry

mp1331 vs mp1388



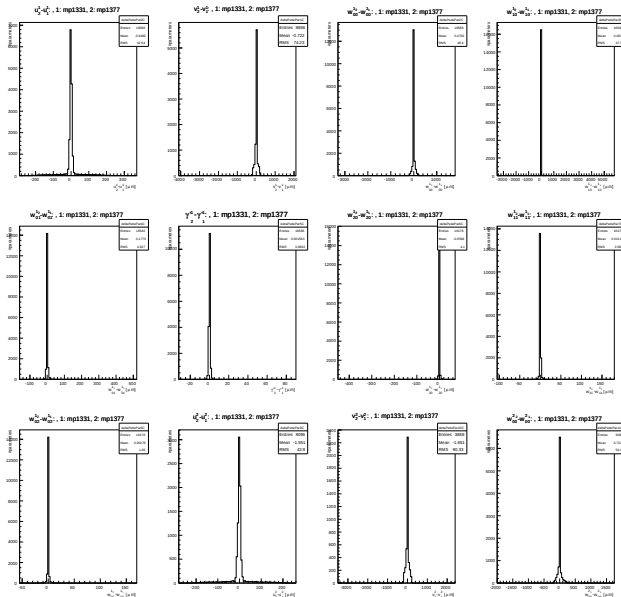
- Differences of parameter values due to patch
- RMS of $\approx 10 \mu\text{m}$

Summary & Conclusions

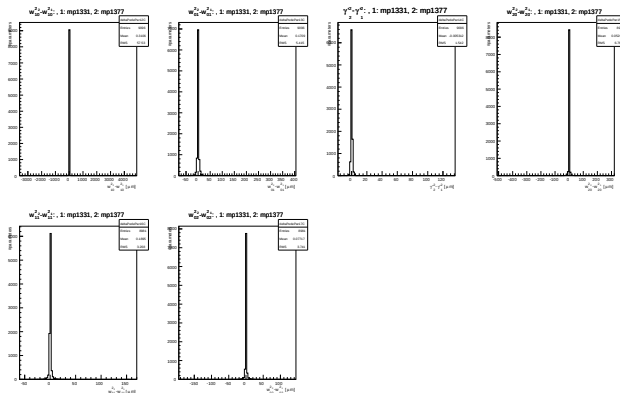
- 2011 legacy-alignment has been redone using the patched CMSSW_4_4_5 version
 - Reported differences of parameter values (RMS) obtained with and without patch
 - ▶ 0th iteration: several 10 μm
 - ▶ 1st iteration: several 10 μm
 - ▶ 2nd iteration: $< 10 \mu\text{m}$
 - In case of 1st and 2nd iteration, observed differences partly due to the fact that different starting geometries have been used
 - Faster reduction of differences when starting from the same geometry each time
 - ▶ Differences of $\approx 10 \mu\text{m}$ after 1st iteration
- Reinterpretation of reported parameter differences
 - Same conclusion: patch does not spoil the alignment result

Additional Material

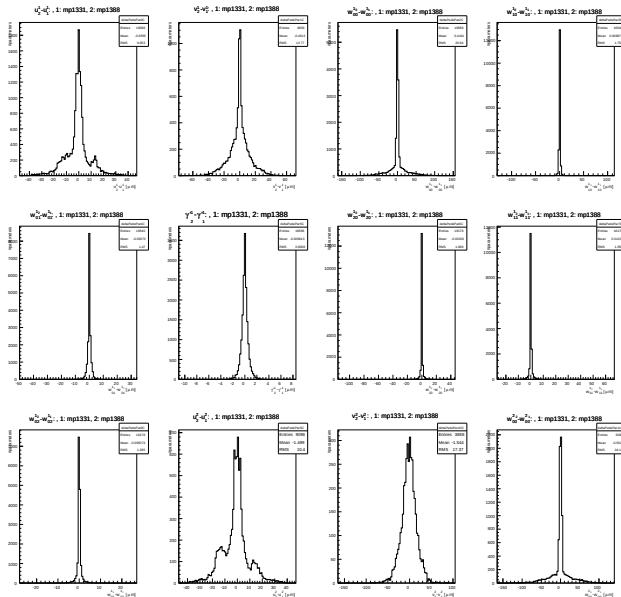
mp1331 vs mp1377 (1/2)



mp1331 vs mp1377 (2/2)



mp1331 vs mp1388 (1/2)



mp1331 vs mp1388 (2/2)

