

New Alignment Parameter Selection Features

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Current version of AlignableTracker and AlignmentParSelector

- *TrackerXYZModule* (e.g. *TrackerTOBModule*)
 - all pixel modules (*GeomDetUnits*)
 - all pure 1D strip tracker modules (*GeomDetUnits*)
 - all 2D strip tracker modules
- *TrackerXYZModuleUnit* (e.g. *TrackerTOBModuleUnit*)
 - components of 2D strip tracker modules (*GeomDetUnits*)

Selection for *GeomDetUnits*:

```
process.AlignmentProducer.ParameterBuilder.Selector = cms.PSet(  
  alignParams = cms.vstring(  
    ...  
    'TrackerTIDModule,101001,endCapSS',  
    'TrackerTIDModuleUnit,101001,endCapDS',  
    ...  
  endCapSS = cms.PSet(  
    rRanges = cms.vdouble(40.0, 60.0, 75.0, 999.0),  
  ),  
  endCapDS = cms.PSet(  
    rRanges = cms.vdouble(0.0, 40.0, 60.0, 75.0),  
  )  
  ...  
)
```

Proposal for AlignmentParameterSelector extension

- Extend current geometry selection capabilities by
 - Detector component specific DetId selection
 - selection of DetIds / DetId ranges
 - veto on DetIds / DetId ranges

Selection for GeomDetUnits:

```
process.AlignmentProducer.ParameterBuilder.Selector = cms.PSet(  
  alignParams = cms.vstring(  
    ...  
    'TrackerTECModuleUnit,101001,tecSingleSensor',  
    'TrackerTECModuleUnit,101001,tecDoubleSensor',  
    ...  
  tecSingleSensor = cms.PSet(  
    phiRanges = cms.vdouble(),  
    ...  
    tecDetId = cms.PSet(  
      ...  
      ringRanges = cms.vint32(1,4),  
      ...  
    )  
  ),  
  ...  
)
```

Proposal for AlignmentParameterSelector extension cont.

- PXB DetId selection
 - ranges for ladder, layer and module
- PXF DetId selection
 - ranges for blade, disk, module, panel and side
- TIB DetId selection
 - ranges for layer, module, string and side
- TID DetId selection
 - ranges for disk, module, ring and side
- TOB DetId selection
 - ranges for layer, module, rod and side
- TEC DetId selection
 - ranges for wheel, petal, module, ring and side

Summary

- New version of AlignableTracker
 - simplifies selection of DetUnits
 - might require adjustments in existing config files
- Extensions in AlignmentParameterSelector
 - DetId based selection of Alignables
 - makes dealing with kinks & bows concerning single and double sensor modules much easier
- Both changes targeted for CMSSW_3_10_0