

Status of ILD@FCCee integration in SGV

Teresa Núñez - DESY

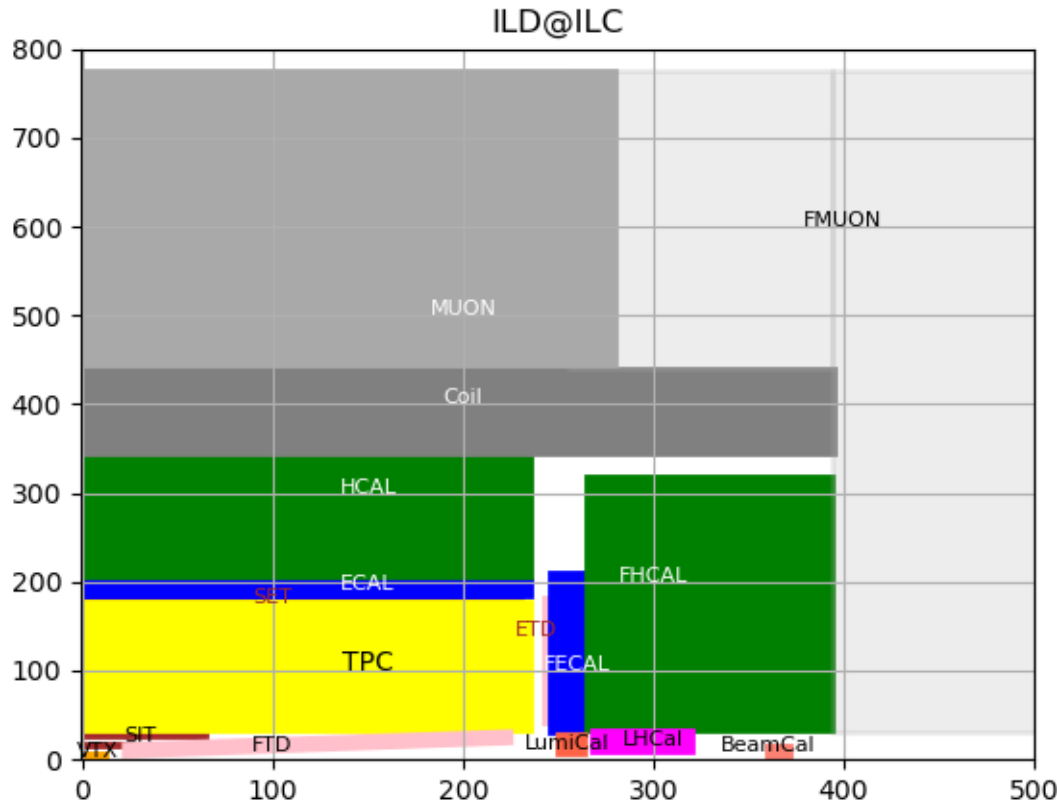


- ILD@FCCee vs ILD@ILC
- Main changes wrt. ILD@ILC geometry
- Outlook

Very preliminary

ILD Software and Analysis Meeting
July 1st, 2026

ILD@ILC vs ILD@FCCee

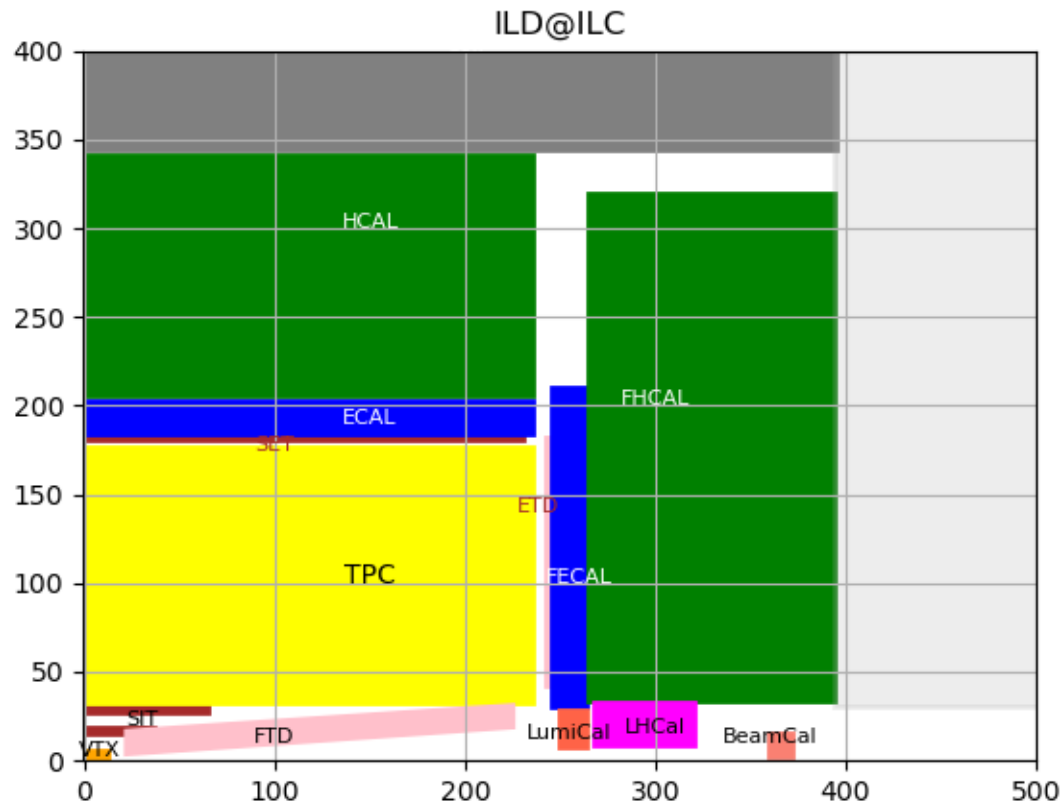


Modifications are needed since at the FCCee ...

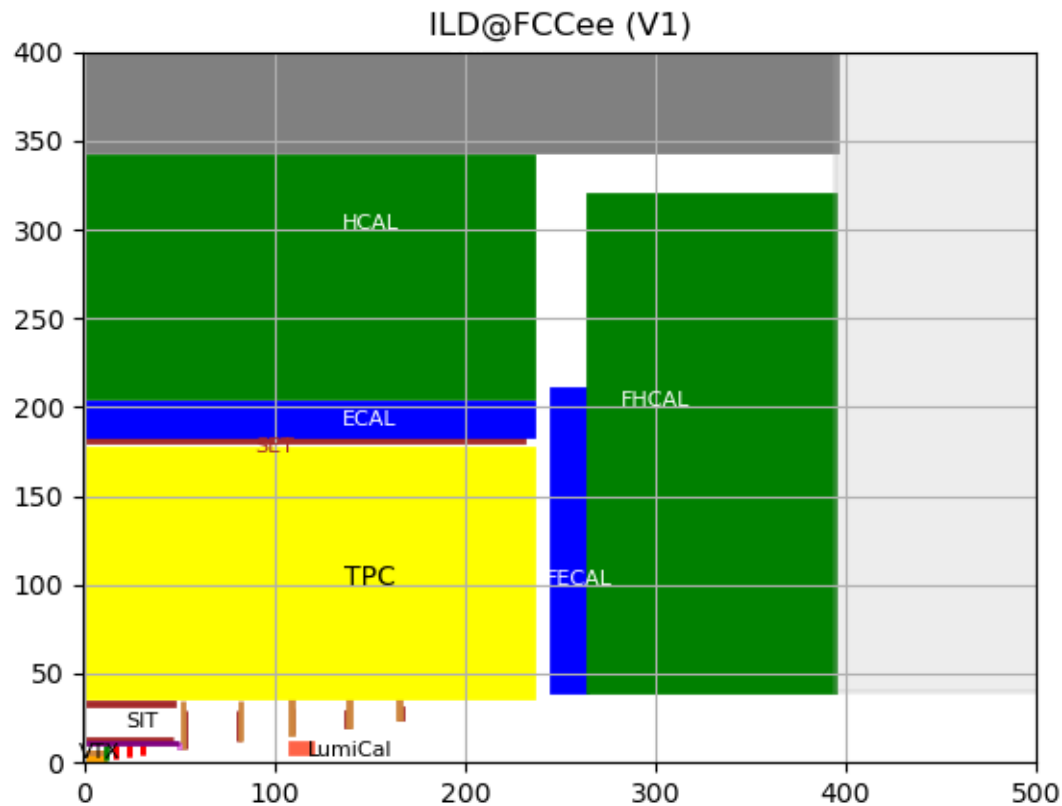
Polar angle area below 100 mrad reserved almost entirely for MDI

Final focus superconducting magnets sit very close to the IP (~ 2.2 m vs 4.1 m at the ILC)

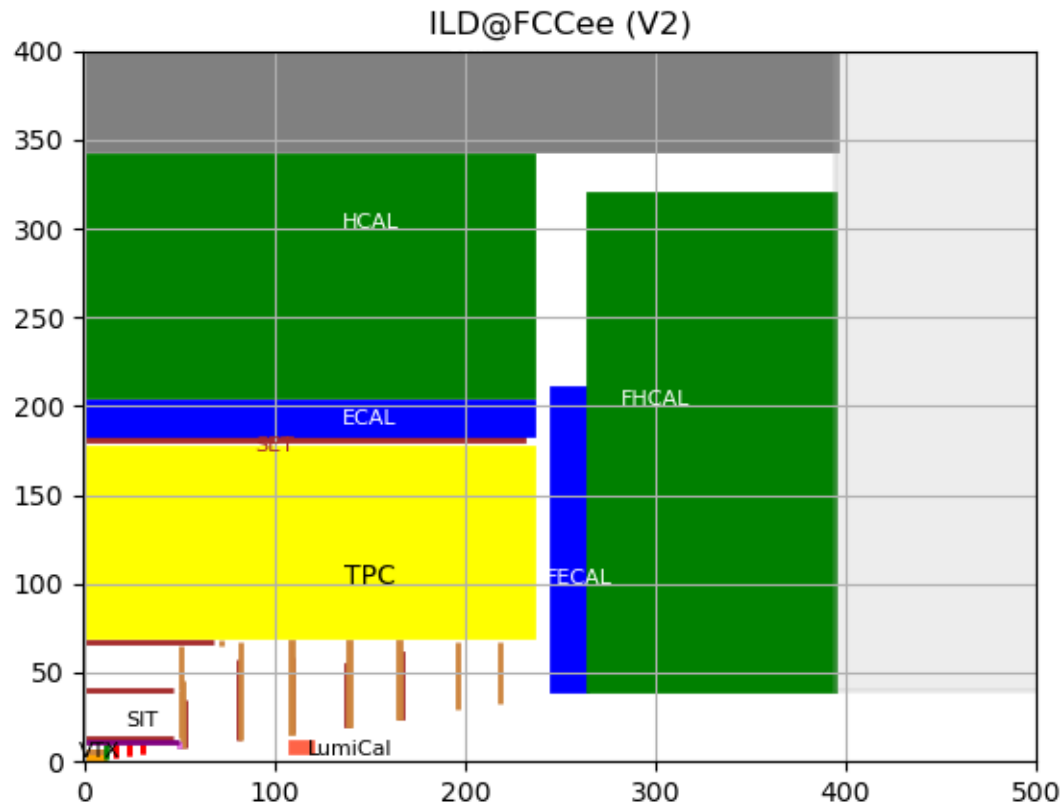
ILD@ILC vs ILD@FCCee



ILD@ILC vs ILD@FCCee



ILD@ILC vs ILD@FCCee



Main changes with respect to ILD@ILC geometry

Magnetic field

- 3.5 T to 2.0 T

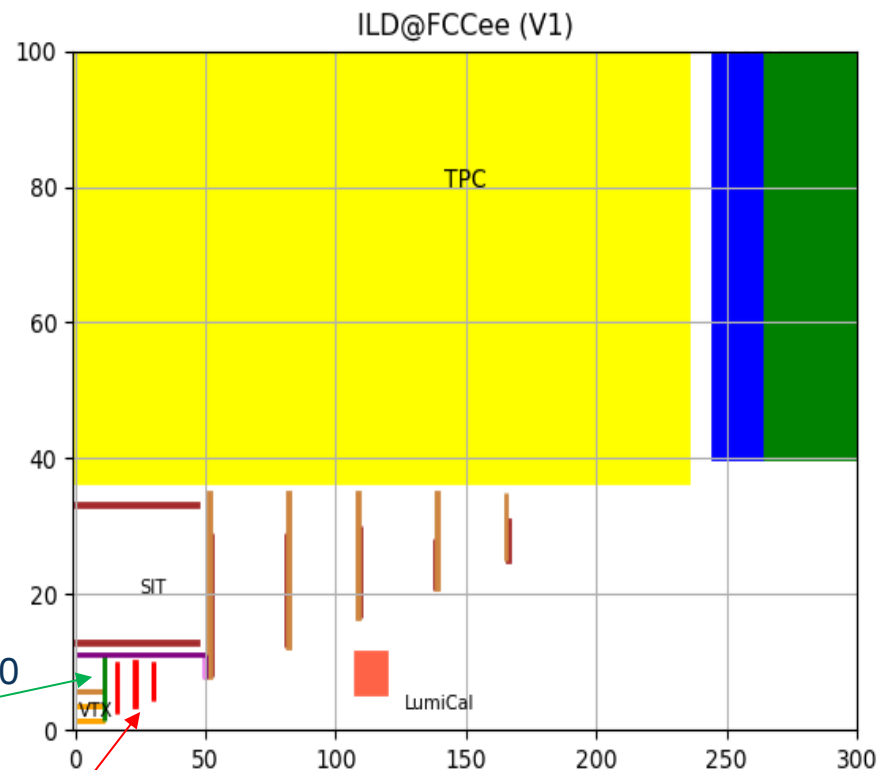
Beampipe

- Inner radius: 1.4 to 1.2 cm
- Material: 0.14% to 0.56% radiation length

Vertex detector (copied from CLD_o7_v07)

- Length three double layers: 6.25/12.5 to 10.9 cm
- Material (X0 per single layer):
 - sensitive part 0.11% to 0.053% X0
 - not sensitive part (@ilc readout) 0.16% to 0.25% X0
- Added in forward region:
 - vertex cable (0.14% X0)
 - endcap (3 double layers, 0.18% X0 per single layer)

- Removed:
 - Barrel support (r 6.7 cm, z to 14.5 cm, 0.14% X0, C)
 - Cryostat (r 10.2, z to 17 cm, 0.5% X0, Al)



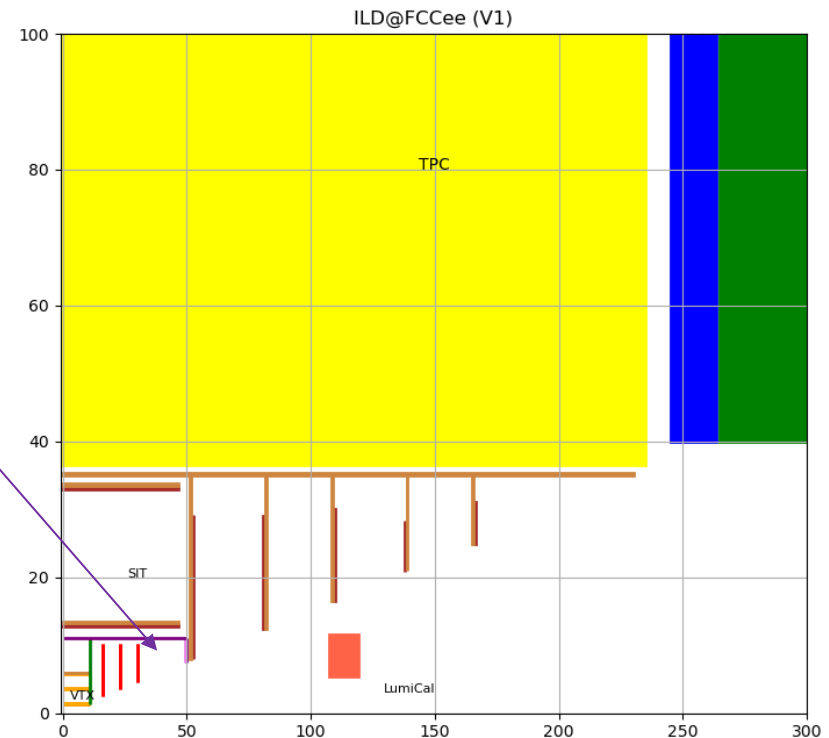
Main changes with respect to ILD@ILC geometry

Beampipe Shells

- Added barrel: r 11.1 cm, z to 50 cm, 0.35 % X0, Carbon fiber
- Added forward:
 - z 49.8 cm, r 7.5 to 11.11 cm, 0.35% X0, Carbon fiber
 - cable, z 49.5 cm, r 7.5 to 11.1 cm, 0.47% X0, Cu

Inner Tracker (SIT)

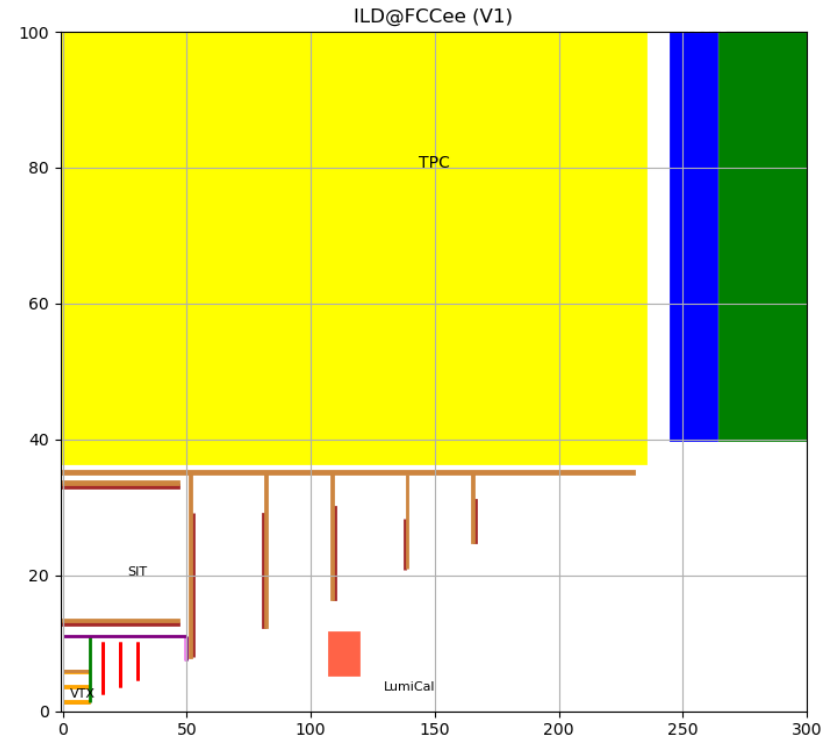
- Two versions:
 - v01: copied from CLD_o2_v07
 - v02: adapted from CLD_02_v07 (increasing inner tracking region/planes, reducing TPC volume)



Main changes with respect to ILD@ILC geometry

Inner Tracker V1

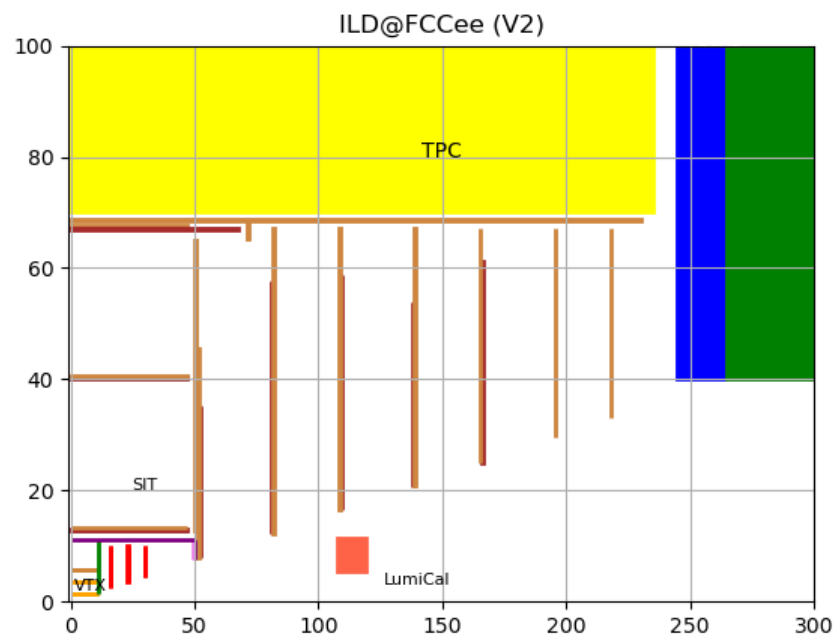
- Two barrel layers:
 - equal length
 - 0.64% to 0.21% X0, Si
 - added support, 0.16% X0, C
- Additional barrel support:
 - up to 230 cm, 1.22% X0, C
- Added five endcap layers
 - 0.21% X0 Si
 - with 0.32 (1) / 0.30 (2) / 0.33 (2)% X0, C, supports



Main changes with respect to ILD@ILC geometry

Inner Tracker V2

- Increase Inner tracker volume
- Three barrel layers:
 - two of equal length and a third one longer
 - 0.64% to 0.21% X0, Si
 - added support, 0.16% X0, C
- Additional barrel support:
 - up to 230 cm, 1.22% X0, C
- Added seven endcap layers
 - 0.21 % X0 Si
 - with 0.32 (1)/0.30 (2)/0.33 (2)/0.36 (2)% X0, C, supports
- Added three supports at low z, 0.58% X0, C



Main changes with respect to ILD@ILC geometry

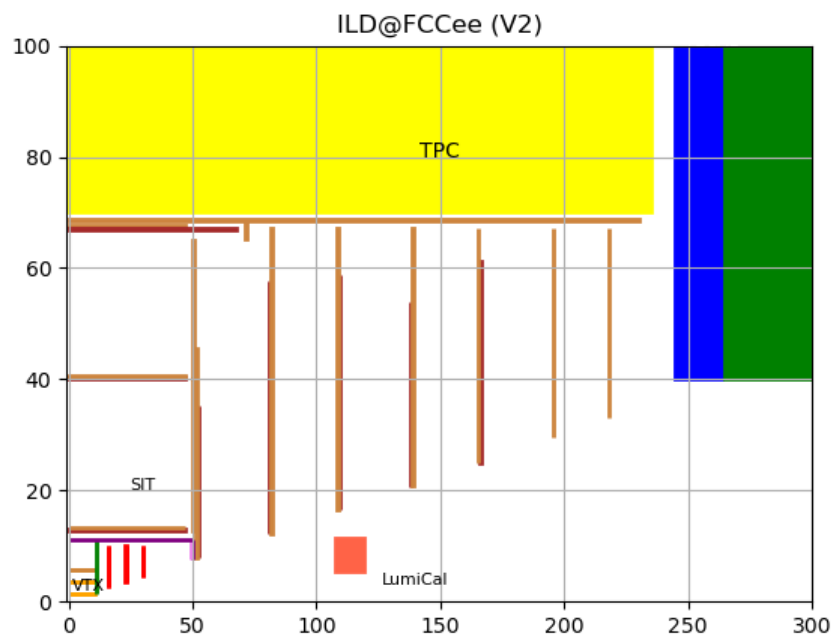
Forward calorimetry

- LumiCal (copied from CLD_o2_v07)
 - r from 8 to 5.5 cm, z from 250.5-263.5 to 107.4-118.65 cm
 - 30% to 25% X₀, W
 - Added sublayers with total 8.5% X₀, Si, 2.5% X₀ Kapton
- Removed BeamCal and LHCAL

Minor changes in ECAL, HCAL, FECAL, FHCAL, HCALRING

Magnet still to be moved

Forward Tracking Disks (FTD) and Endcap Tracking Detector (ETD) removed



Outlook

- Check the speed of processing events and reduce the number of layers (by grouping) if needed
- Generate example plots (momentum resolution, IP resolution, ...) and check behaviour

Many thanks for any feedback for improving the implementation