Making the ILD Case

Two issues: 1) Costs **2) proving wisdom of our decisions to colleagues from other experiments!**

1) Size Does Matter!

a) How much yoke needed for field quality inside detector?
Can ILD/SiD share a common magnetic shield wall?

=> magnetic field & yoke design study
=> impact of non-uniformities on ZH->llH

b) How far can we shrink ILD before physics suffers at 500GeV? 1TeV?
LDCsize? 90%LDCsize? ...?

=> make scalable (or 2-3 small) model, run key analyses (eg ZHH,ttbar,ttH)

A third issue:

3) Stay prepared for the Unknown!

=> continue to make the BSM case (cf SCJ statement)
=> ability to reconstruct kinks, V0, non-pointing photons, exclusive hadronic decay modes etc might be important
- even if not guaranteed today....

2) "ILD Heresy", but required to convince!

a) Why particle flow?
Benchmarks with
- 2-4 jets + 2 invisible particles
  eg vvH, vvHH (width and triple-H)
- taus, exclusive hadronic decays

How would an excellent conventional calo perform? (LAr,...?)

=> Mokka/DD4HEP driver?
Or use ATLAS/CMS? Or parametrisation?

b) Why a TPC?
- reco of low pt tracks -> NP, tau, flavour

=> improve low pt tracking (ongoing..)
- late decays, kinks, V0s

=> make performance plots!
- dE/dx -> really better than all-Si? CMS..
- late decays, kinks, V0s

=> dE/dx parametrisation in MarlinReco
=> PID -> mass -> use in track fit / vertexing
=> reconstruct excl. decays of NP, or heavy flavour (eg A_FB(top): vtx charge...)

benchmark for all this: eg Higgsinos!