

# Samples at 50 and 70 TeV

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# Introduction

- Exploring the physics case of a lower energy FCC collider
  - We'd like to look at two energies
    - 50 TeV = LHC magnets in the FCC tunnel
    - 70 TeV = 12 T magnets in the FCC tunnel
      - Lumi estimates for the 70 TeV samples will be taken from [here](#)
  - Limited time and people to do studies by the European Strategy, so we're aiming to focus on key analyses
    - diHiggs
    - Single Higgs
      - ttH
      - bb/cc
      - $\tau\tau$
      - WW
      - invisible
- Can start with back of the envelope projections for NP

# Samples

- DiHiggs
  - $HH \rightarrow 4b$
  - $HH \rightarrow 2b2\tau$
- Single Higgs
  - $VH \rightarrow llbb, qqbb$  ( $VH = \rightarrow l\nu bb, \nu\nu bb$ )
  - $VH \rightarrow llcc$
  - $ggF H \rightarrow bb$  (boosted)
  - $H \rightarrow \tau\tau$  (ggF, VBF)
  - $ttH \rightarrow \gamma\gamma$
  - $H \rightarrow WW$  leptonic (ggF, VBF)
  - $H \rightarrow inv$  (VBF)
- Backgrounds
  - $t\bar{t}$  (all had, semileptonic)
  - multijet
  - $WW, WZ, ZZ$  (semileptonic/hadronic)
  - $ttV?$
  - vector boson + jets (particularly HF jets)
  - VBF  $W$  and  $Z$  to leptons