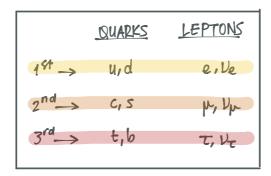
non-simplified SUSY 7-coannihilation at LHC & ILC.

- LSP: lightest SUSY particle/partner
- ILD: International Large Detector
- ILC: International Linear Collider
- R-Parity: 22 symmetry on the model that forbids the renormalizable couplings.
 - more clearly -> it prevents unwanted terms in the theory in order to not violate experimental bounds in the phenomenology.
- GUT scale: grand unification energy -> above this, EM, weak and strong forces are helieved to be equal in strength, and become one united force.
 - $\tilde{\tau}$: stau \rightarrow superporter of τ lepton.
- superportner: according to SUSY, all fermions must have a boson portner, and all bosons must have a fermion portner.
 - unbroken susy predicts that mporticle = msuperpartner
 - naturalness: a theory not containing dimensionless numbers too large or too small.
 - Generations:



- coannihilation -> mutual annihilation of colliding pairs.
- HL-LHC -> high luminosity LHC.
- b-tagging: identifying jets originated from the bottom quark.
- Detector response is simulated with Delphas 3.0.9
 - Also used in Snowmass equality

- Able to include pile-up
- FostJet -> pile-up subtraction, jet clustering.
- Pythia 6 → 2^{*} +une
- PROSPINO 2 → NLO / Cross section calculated.
- Full Hadronic Search:
 - long decay chains --> multiple jets --> longe hadronic energy / large missing Pt.
 - HT: scalal sum of Jet momenta

 cuts: PT>50 GeV

 In1<2.5
 - MHT: missing hadronic Et. -> abs of negative vectorial sum

Cuts: PT>30 GeV

- SM background of this search is mostly from:

- At high MHT, QCD background can be neglected.
- Baseline selections: (8 TeV)
 - Minimum 3 Jets, pT>50 GeV, In1 < 2.5, HT>1000 GeV
 MHT>500 GeV
 - o To avoid QCD background:

 $|\Delta \emptyset (j_n, MHT)| = a_{timuthal}$ angle difference between leading jets of MHT

(n = 1,2) $|\Delta \phi(j_n, MHT)| > 0.5$ $|\Delta \phi(j_3, MHT)| > 0.3$

- Veto events at:

PT>10 GeV $|\eta| < 2.4$ (isolated muons) PT>10 GeV $|\eta| < 2.5$ (electrons)