Contribution ID: **40** Type: **Oral presentation using Zoom**

Searching for Charged via $e^+e^- \to H^+H^- \to \bar{b}cb\bar{c}$ at Linear colliders

Wednesday 27 October 2021 10:00 (20 minutes)

We present a search for the charged Higgs boson via $e^+e^- \to H^+H^- \to bcbc$ at the 500 GeV ILC. In a general two Higgs doublet model without Z_2 symmetry, extra Yukawa couplings such as ρ_{tc} and ρ_{tt} can drive baryogenesis, but searches at the HL-LHC may still come away empty-handed. In this report, we take $m_(H^+) = m_H = m_A = 200$ GeV with $\rho_{tc} = \rho_{tt} = 0.1$, and no h(125)-H mixing. We study the four jet final state with two b-tagged, which would clearly be overwhelmed by QCD background at LHC, but with electroweak production of H^+H^- at ILC, the signal is discoverable. We find that ILC can capture this signature with significance at 20σ or better with integrated luminosity of 1 ab^{-1}. We also show that the mass of Hˆ+ can be recovered by requiring the two b and light jet pairs be approximately equal in mass, without assuming the mass. Thus, ILC can probe low mass Higgs bosons in multijet final states to compliment HL-LHC in the future.

1st preferred time slot for your oral presentation

13:00-15:00 JST (6:00-8:00 CEST, 0:00-2:00 EDT, 21:00-23:00 PDT)

2nd preferred time slot for your oral presentation

15:30-17:30 JST (8:30-10:30 CEST, 2:30-4:30 EDT, 23:30-1:30 PDT)

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Track Classification: Parallel sessions: Topical Groups: Session H: BSM particle production