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One-loop effects of SUSY on the third generation fermion-pair and the Zh production at ILC

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Within the framework of the minimal supersymmetric standard model, we investigate one-loop effects of the supersymmetric particles on the fermion-pair production in the third generation and Zh in the ILC energy region. Three sets of the SUSY parameters are proposed which are consistent with the observed Higgs mass, the muon $g-2$, the Dark Matter abundance, etc. We discuss on the possibility of discovering the signals consistent with SUSY as well as of experimentally distinguishing the proposed sets of SUSY parameters. Minimal Supersymmetric Standard Model (MSSM) naturally explains: (1) The elementary Higgs with $m_h=125\text{GeV}$, (2) WIMP dark matter with relic abundance ~ 0.1 . In addition, we consider other constraints on the MSSM parameters from (3) muon $g-2$, (4) B-physics, (5) SUSY searches @ LHC and (6) WIMP searches, where we use “SuSpect2”, “MicrOMEGAs” and “SUSY-HIT”. Two typical parameter sets, which are consistent with (1)~(6) constraints, are selected. For the two sets, we investigate one-loop effects of the particles in the pair production of third generation fermions and the Zh production at the ILC, where we use “GRACE”. The virtual effects of MSSM in the processes could become (1~5)% at the early stage of the ILC. Discrimination of the light and heavy stop scenarios would be possible in top pair and Zh.

Biography

Tadashi Kon has completed his PhD from Rikkyo University and Postdoctoral studies from Tokyo Metropolitan University. He is the Professor of Seikei University, Faculty of Science and Technology.

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