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Higgs and BSM physics at CLIC

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The Compact Linear Collider (CLIC) is an option for a future multi-TeV linear electron-positron collider, offering the potential for a rich SM physics programme and sensitivity to a wide range of BSM phenomena. The physics reach of CLIC has been studied for several centre-of-mass energies, allowing a staged construction and providing the ideal scenario for precise studies of the properties of the ~125 GeV Higgs boson. Operation at a few hundred GeV allows the couplings and width of the Higgs boson to be determined in a model-independent manner through the study of the Higgsstrahlung and WW-fusion processes. Operation at higher centre-of-mass energies provides high statistics and the potential to study the top Yukawa coupling. At the highest energy (presently planned to be 3 TeV c.m.) the Higgs boson self-coupling can be accurately measured. The evolution of the physics sensitivity with centre-of-mass energy is presented in terms of a model-independent global fit. The higher energy stages also offer sensitivity to a wide range of BSM phenomena. Within the kinematic limit, new particles can be measured precisely using pair-production. CLIC is particularly well suited to studying weakly interacting states due to the clean experimental conditions and low backgrounds compared to hadron colliders. Indirect searches using precision observables give access to much higher mass scales. Examples for both approaches will be discussed, based on full simulation studies of a wide range of final states.

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