Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Determination of the double Higgs cross section and trilinear Higgs coupling sensitivities at Muon Collider LAURA BUONINCONTRI, INFN and University of Padua, DONATELLA LUCCHESI, CAMILLA CURATOLO, University and INFN of Padua, LORENZO SESTINI, INFN Padua, SERGO JINDARIANI, Fermilab , ALESSIO GIANELLE, PAOLO ANDREETTO, INFN Padua, NAZAR BARTOSIK, INFN Turin, MASSIMO CASARSA, INFN Trieste, KATHERINE PACHAL, Duke University, HANNSJOERG WEBER, Fermilab , LAWRENCE LEE, Harvard University, SIMONE PAGAN GRISO, KAROL KRIZKA, Lawrence Berkeley National Laboratory, MAXIMILIAN SWIATLOWSKI, MARCO VALENTE, TRIUMF — A multi-TeV center-of-mass energies muon collider is the ideal machine to study the Higgs boson properties. In fact, in the multi-TeV energies scale the double and triple Higgs boson production rate will be sufficiently high to directly measure the parameters of trilinear and eventually quadrilinear self-couplings, enabling the precise determination of the Higgs boson potential. In this contribution the expected sensitivity of an experiment at muon collider at $\sqrt{s}$ of 3 and 10 TeV on double Higgs production cross section and on the trilinear self-coupling is presented by using the full simulation of the detector and taking into account the effects of the beam-induced background. Signal ($mu^+mu^- \rightarrow HH\nu\bar{n}u$, where H $\rightarrow b\bar{b}$) and physics backgrounds processes are fully simulated and reconstructed. Multivariate analysis techniques are used to separate signal from background events and to determine the expected sensitivity on the double Higgs cross section measurement and the trilinear self-coupling confidence interval.

Donatella Lucchesi
University of Padova

Date submitted: 07 Jan 2021 Electronic form version 1.4