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Studying total cross section for proton-proton interactions at large hadrons collider

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This paper describes how to use gene expression programming (GEP) as an evolutionary computational optimization approach. GEP, as a machine learning technique is usually used for modeling physical phenomena by discovering a new function. In case of modeling the p–p interactions at large hadrons collider (LHC) experiments, GEP is used to simulate and predict the total cross-section, as a function of total center-of-mass from low to high energy √s, Considering the discovered function, trained on experimental data of particle data group shows a good match as compared with the other models. The predicted values of total cross section at √s = 8, 10 and 14 TeV are found to be 10, 105 and 111 mb, respectively. Moreover, those predicted values are in good agreement with those reported by Nakamura, Cudell and Block.

Biography

Amr Radi has completed his PhD from Birmingham University and Post-doctoral studies from Aston University, UK. He has published more than 300 papers in reputed journals and has been serving as an Editorial Board Member of repute. His main research interests lie in the areas of Computational Physics. His research effort focuses on using the tools of computational physics to understand physics phenomena. The goal of his research is to understand particle physics via a combination of analytical theory and simulations/modeling.

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