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Advanced Calculus for Precision Physics

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The Advanced Calculus for Precision Physics (ACPP) use case is an initiative dedicated to enhance the computation of scattering amplitudes and cross-sections to support the phenomenology analyses for prospects of detection and observations of new physics events in advanced collider physics programs (such as CERN and Fermilab) and gravitational wave detectors (including LIGO-VIRGO-KAGRA, ET, and LISA). In this presentation, I will highlight our ongoing research and development efforts focused on creating software and employing techniques to improve the efficiency of evaluating multi-loop scattering amplitudes. This work aims to contribute significantly to deciphering the physics encoded in data collected by collider and gravitational wave detectors.

Presenters: RONCA, Jonathan (Roma Tre university); MANDAL, Manoj Kumar (Istituto Nazionale di Fisica Nucleare); MASTROLIA, Pierpaolo (Istituto Nazionale di Fisica Nucleare); TORRES BOBADILLA, William J. (Max-Planck-Institute for Physics)

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