



Allgemeines Physikalisches Kolloquium

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Precision theory predictions for high energy collider physics

Modern particle collider experiments allow to measure scattering cross sections and particle production rates to high accuracy. These measurements provide in-depth information on the underlying particle dynamics, and they can be used for precision determinations of Standard Model parameters and in indirect searches for new physics effects. To match the quality of the experimental data, equally precise theory predictions are needed, which are obtained by going to high orders in perturbation theory. We describe techniques and recent results for precision calculations and discuss their impact for particle phenomenology on selected examples.