Phenomenology 2025 Symposium



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A Brief History of Mass

Monday 19 May 2025 15:00 (15 minutes)

It has been known since the 1950's that an unstable particle is associated with a complex pole in the propagator. This had to be rediscovered twice: in the early 1970's in the context of hadronic resonances, and in the early 1990's in the context of the Z boson. The physical mass of the particle is the real part of the pole in the complex energy plane. In hadronic physics, this replaced the "Breit-Wigner mass," which was found to depend on the parameterization of the "energy-dependent width." In Z physics, it replaced the "on-shell" mass, which was found to be gauge dependent. Although the mass defined from the complex pole position has been widely discussed in the literature, it has not yet made its way into quantum field theory textbooks.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

Author: WILLENBROCK, Scott (University of Illinois at Urbana-Champaign)Presenter: WILLENBROCK, Scott (University of Illinois at Urbana-Champaign)Session Classification: Electroweak

Track Classification: Electroweak, Higgs, and Top Quark Physics