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Proton resonances in meson production

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The description of the proton properties from its quark and gluon substructure is a topic which is far from being well understood. The strong force binding together the constituents behaves remarkably differently at high and low energies.

The main experimental tool to probe the proton is electron scattering off proton targets. At high energies, the electrons break up the protons and the underlying physics is well understood in terms of the theory that describes the strong force between quarks and gluons. However, at low energies the connection to the physics of the constituents becomes obscured. In the data spectrum, many resonances appear as interfering and overlapping peaks whose description is highly convoluted. In addition, many of them do not follow the usual quark-antiquark (meson) or 3-quark (baryon) frameworks, thus being dubbed as exotic resonances.

In this talk, I focus on the theoretical description of the resonant contributions to the proton structure. I also give emphasis to the exotic states, in view of the ongoing and near-future high-luminosity experiments designed for their search and improved understanding.

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