

First Study of Exclusive Production of Multi-Hadron Final States in Ultraperipheral Collisions

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The exclusive photoproduction of multi-hadron final states in ultraperipheral collisions (UPCs) provides a unique avenue to explore quantum chromodynamics (QCD) and the nature of resonances emerging from gluonic interactions.

The ALICE Collaboration has recently performed measurements of exclusive four-pion photoproduction, revealing data that suggest the presence of two resonances. However, the underlying nature of these resonances remains poorly understood, necessitating further investigation.

The enhanced capabilities of the ALICE detector during Run 3 open new opportunities for the study of multi-pion final states, including six- and eight-pion systems, and processes involving charmonium decays into four-hadron final states. These studies provide an invaluable means to probe the dynamics of highly dense gluonic matter and the interplay between resonant and nonresonant contributions in hadronic systems.

In this talk, we will outline the ALICE program focused on these analyses, presenting initial results that leverage angular correlation studies to disentangle the properties of the observed resonances.

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