Study of the Δ(1232) resonance substructure in the pγ→Δ(1232) process through helicity amplitudes

The substructure of the $\Delta(1232)$ resonance in the $p\gamma^* \to \Delta(1232)$ process is studied through helicity transition amplitudes within the quark model framework. We consider the involved baryons composed of three quarks, and both the quark core and meson cloud contribute to the transition amplitudes. The comparison of theoretical results with experimental data reveals that, rather than the $L = 0$ component of the $\Delta(1232)$ resonance, it is the $L = 2$ component that significantly affects its $S_{1/2}$ amplitude. These findings indicate that the $\Delta(1232)$ resonance likely contains a substantial $L = 2$ component, challenging the conventional view of the $\Delta(1232)$ resonance as an $L = 0$ baryon.

Primary author(s) : Dr KAEWSNOD, Attaphon (Suranaree University of Technology)

Co-author(s) : Dr XU, Kai (Suranaree University of Technology); Dr SANGKHAKRIT, Thanat (Suranaree University of Technology); Dr ZHAO, Zheng (Suranaree University of Technology); Prof. YAN, Yupeng (Suranaree University of Technology)

Presenter(s) : Dr KAEWSNOD, Attaphon (Suranaree University of Technology)