MECHANISMS OF PHOTOPRODUCTION[1]

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This contribution summarizes our understanding of the mechanisms of meson photoproduction, including three important processes: diffractive photoproduction, baryon resonance production, and t-channel meson exchange. Selection of each as the dominant mechanism is possible through the choice of photon energy, quantum numbers of the final state, and range of t. Both diffractive photoproduction and t-channel exchange are of interest as sources of mesons for an experimental meson spectroscopy program, since the basic processes are familiar, if not yet quantitatively understood in general, and the meson resonances produced can be anticipated. Although diffraction is "explained" by invoking pomeron exchange, what this effect constitutes at the QCD level is poorly understood, and a comparison of diffractive photoproduction amplitudes of the various $C = (-)$ resonances might lead to a better understanding of this aspect of QCD. In contrast, meson resonance production through intermediate baryon resonances is a complicated process with many competing amplitudes, so the question of which higher-mass mesons are produced from baryons with large amplitudes cannot yet be answered. An additional advantage of t-channel meson exchange is the access to all J^{PC} quantum numbers, "full quantum number coverage", whereas diffractive photoproduction only produces $C = (-)$ states. At photon energies appropriate to Jefferson Laboratory, diffractive photoproduction and t-channel meson exchange, especially one-pion exchange, appear to be the most appropriate mechanisms to exploit in an experimental program of meson spectroscopy.

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