

Amplitudo Transisi Fotoproduksi Meson Eta Prime pada Nukleon dengan Menyertakan Kontribusi Resonan Nukleon hingga Spin 3/2 = Transition Amplitude of Eta Prime Meson Photoproduction off Nucleon with Contribution from Nucleon Resonances up to Spin 3/2

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Abstrak

Fotoproduksi meson pada nukleon dipelajari dengan menggunakan model interaksi Lagrangian efektif. Model interaksi Lagrangian efektif digunakan untuk menghitung amplitudo transisi dengan memperhitungkan kontribusi dari kanal-s non-resonan, kanal-u non-resonan, kanal-t, serta resonan nukleon spin 1/2 $N^*(1895)$ dan $N^*(1895)$, dan spin 3/2. Faktor bentuk digunakan hanya pada kanal-t agar amplitudo transisi yang didapatkan tetap Gauge Invariant. Amplitudo transisi invariant yang telah didapatkan kemudian didekomposisi menjadi matriks-matriks dalam bentuk yang mempermudah dalam melakukan perhitungan numerik. Nilai yang dicari adalah penampang lintang differensial dengan menggunakan energi sistem dari 1.925 MeV sampai 2.795 MeV dalam beberapa variasi sudut. Fitting grafik hubungan penampang lintang differensial dengan energi sistem dalam beberapa variasi sudut menunjukkan terjadinya divergensi penampang lintang sebagian seiring dengan meningkatnya energi sistem.

.....' meson photoproduction off nucleon is studied by using the effective Lagrangian approach. Effective Lagrangian approach were used to calculate the transition amplitude of the reaction by including the contribution of the non-resonant s- and u-channel, the vector meson exchange terms, and also the nucleon resonances of spin-1/2 $N^*(1895)$ and $N^*(2100)$, and spin-3/2. Form factor was used only on the t-channel so that the transition amplitude's gauge invariance was conserved. The invariant transition amplitude then was decomposed into matrices which can help to simplify the numerical calculation. The observables that were investigated were the differential cross section with the energy of the system from 1.925 MeV up to 2.975 MeV in several angles variation. The fitting graph of the relation between differential cross section and energy of the system in several angles variation displays that the differential cross section was divergent as the energy of the system rises.