

Signifikansi Resonans Nukleon P₁₁ (2100) terhadap Fotoproduksi Kaon pada Kanal K = Significance of Nucleon Resonance P₁₁ (2100) off Kaon Photoproduction in KI Channel

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Abstrak

Model isobar yang dikembangkan untuk fotoproduksi kaon pada kanal K Λ dapat menjelaskan kedua kanal isospin K Λ dan K Λ . Model tersebut dikembangkan dengan menyertakan data terbaru kolaborasi CLAS. Particle Data Group (PDG) baru saja merilis daftar resonans nukleon terbaru, salah satunya resonans P₁₁(2100). Dengan mempertimbangkan kehadiran resonans baru tersebut, diharapkan adanya peningkatan kecocokan antara model teoretis dan data eksperimen. Formalisme ini digunakan untuk mendapatkan observabel-observabel yang diperhitungkan. Perhitungan analitik disertakan pada perhitungan numerik (proses fitting) untuk mendapatkan kecocokan antara model teoretis dan data eksperimen dengan meminimalisasi nilai chi square. Didapatkan bahwa model pengembangan (model A) memiliki kecocokan lebih baik dibandingkan model lama(model B) terhadap data eksperimen. Namun kontribusi resonans nukleon yang disertakan tidak terlalu signifikan, dibuktikan dengan penurunan nilai chi square yang kecil.

.....The isobar model for kaon photoproduction in the K Λ channel can explain the two isospin channels K Λ and K Λ . This model was developed by including the latest data from the CLAS collaboration. Particle Data Group (PDG) has just released the latest nucleon resonances list, one of them is P₁₁(2100) resonance. Taking into account the presence of a new resonance, it is hoped that there will be an increase in the agreement between theoretical model and experimental data. The formalism used in the study was obtained by calculating the scattering amplitude for the nucleon resonance with spin 1/2. This formalism was used to obtain the calculated observables. The obtained analytical formulation was used in the numerical calculations, i.e., in the fitting process to obtain the best agreement between theoretical model and experimental data by minimizing the value of chi square. It was found that the present model (model A) has a better performance than the old model (model B). However contribution of new nucleon resonance is not significant, as indicated by a small decrease in the value of chi square.