Signifikansi Resonans Nukleon P_11 (2100) terhadap Fotoproduksi Kaon pada Kanal K = Significance of Nucleon Resonance P_11 (2100) off Kaon Photoproduction in KΛ Channel

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Abstrak

Model isobar yang dikembangkan untuk fotoproduksi kaon pada kanal KLambda dapat menjelaskan kedua kanal isospin K+Lambda dan K0Lambda. 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 KLambda channel can explain the two isospin channels K+Lambda and K0Lambda. 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 indiated by a small decrease in the value of chi square.