

Fotoproduksi kaon netral pada deuteron = Neutral kaon photoproduction on deuteron

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Abstrak

[ABSTRAK

Semakin baik dan banyaknya hasil eksperimen di bidang nuklir, menjadi faktor pendorong bagi fisikawan nuklir untuk melakukan penelitian lebih lanjut mengenai interaksi dan struktur nuklir. Alhasil, banyak reaksi yang bertujuan untuk menjelaskan, membandingkan bahkan memperkirakan hal ini, salah satunya adalah fotoproduksi kaon netral pada deuteron. Telah dipelajari sebuah model sederhana untuk reaksi fotoproduksi kaon netral pada deuteron yaitu model isobar dengan menggunakan pendekatan impuls. Penelitian ini bertujuan untuk mempelajari penampang lintang eksklusif dan inklusif dari fotoproduksi kaon netral pada deuteron dengan beberapa keadaan kinematik, dan dibandingkan dengan eksperimen [6]. Hasil yang didapatkan menunjukkan penampang lintang inklusif lebih besar daripada penampang lintang eksklusif karena pada penampang lintang inklusif hanya mendeteksi kaon saja, dan untuk penampang lintang eksklusif mendeteksi kaon dan hiperon secara simultan, makin banyak partikel yang dideteksi makin kecil penampang lintangnya. Penampang lintang eksklusif dengan momentum proton = 0 lebih besar dibandingkan dengan momentum proton tidak nol, hal ini dikarenakan peluang terjadinya reaksi lebih besar ketika neutron dalam deuteron diam. Untuk penampang lintang eksklusif dengan variasi momentum proton, paling besar penampangnya berada pada arah sumbu Z, yaitu searah dengan masuknya proyektil foton riil saat terjadinya reaksi. Kaon paling banyak mengalami hamburan pada sudut kecil, sementara pada sudut yang besar penampang lintangnya kecil. Amplitudo transisi deuteron berperan penting dalam reaksi eksklusif maupun inklusif yaitu dalam menentukan puncak-puncak kurva penampang lintang tersebut.

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ABSTRACT

The abundance experimental results in the nuclear field, becomes a driving factor for nuclear physicists to conduct further research on interactions and nuclear structure. As a result, many reactions aims to explain, compare and even estimate it, one of which is the neutral kaon photoproduction on deuteron. It has been studied a simple model for the reaction of the neutral kaon photoproduction on deuteron with isobars model using impulse approximation. This research aims to learn the exclusive and inclusive cross section of neutral kaon photoproduction on deuteron with some kinematic state, and compared with experiments [6]. The results obtained indicate the inclusive cross section larger than the exclusive cross section because for the

inclusive cross section only detect kaon, and exclusive cross section detect kaon and hyperon simultaneously, more particles are detected the smaller cross section will be. Exclusive cross section with proton momentum = 0 is larger than when proton momentum is not zero, because of the possibility for greater reaction is when a neutron in the deuteron is not moving. For the exclusive cross section with variation proton momentum, the largest cross section is in the axis-Z, that have the same direction with the entry of projectile photon real. Kaon experiences the most scattering at small angles, while at large angles have a small cross section. Transition amplitude on deuteron plays an important role in the reaction that exclusive or inclusive in determining the peaks of the cross section of the curve, The abundance experimental results in the nuclear field, becomes a driving factor for nuclear physicists to conduct further research on interactions and nuclear structure. As a result, many reactions aims to explain, compare and even estimate it, one of which is the neutral kaon photoproduction on deuteron. It has been studied a simple model for the reaction of the neutral kaon photoproduction on deuteron with isobars model using impulse approximation. This research aims to learn the exclusive and inclusive cross section of neutral kaon photoproduction on deuteron with some kinematic state, and compared with experiments [6]. The results obtained indicate the inclusive cross section larger than the exclusive cross section because for the inclusive cross section only detect kaon, and exclusive cross section detect kaon and hyperon simultaneously, more particles are detected the smaller cross section will be. Exclusive cross section with proton momentum = 0 is larger than when proton momentum is not zero, because of the possibility for greater reaction is when a neutron in the deuteron is not moving. For the exclusive cross section with variation proton momentum, the largest cross section is in the axis-Z, that have the same direction with the entry of projectile photon real. Kaon experiences the most scattering at small angles, while at large angles have a small cross section. Transition amplitude on deuteron plays an important role in the reaction that exclusive or inclusive in determining the peaks of the cross section of the curve]