Département de Physique Nucléaire

Séminaires du DPhN

Vendredi 31/10/2014, 11:00-12:00

Bat 703, p 45, CEA Saclay, Orme des Merisiers

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Studying Baryon Resonances with the CLAS (JLab) and BGO-OD (ELSA) Detectors

An energetic photon incident on a nucleon can interact directly with one of the quarks inside, causing the quark to undergo a flip in spin or endowing the quark with an orbital or radial excitation, and thus, by exciting the quarks to a higher energy state, the nucleon becomes more energetic. These excited states are called baryon resonances (N*s) and are short lived (~10-24 s.) These N*s will dominantly decay into a ground-state nucleon and one or more mesons. The types of mesons produced and how they are distributed in space in the decay process provide key information on the internal symmetries of the quarks in the nucleon. The study of these excited states is called spectroscopy. And just as ordinary optical spectroscopy proved to be the incisive tool for understanding the electronic structure of the elements, we expect nucleon spectroscopy will reveal many of the basic features of the quark substructure of matter, and, in turn, it will provide a critical testing ground for theoretical models describing these systems.

In this talk I will discuss the underlying physics ideas of baryon resonances within the context of the complementary transatlantic experiments CLAS (JLab) and BGO-OD (ELSA).

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