

Preface

The subject of interaction of hadrons with other hadrons and nuclei has attracted much attention recently, mainly due to new experiments that are planned in Germany, India, Japan and USA. Another reason for the interest is that it covers the important subjects in nuclear physics such as hadrons in nuclear medium, photo and electroproduction of hadrons, models of hadrons and hadronic excitations etc. Also, a sizable community of theorists and experimentalists in India are active in this area of physics. Keeping in view of all these aspects, workshops on 'Hadron Physics' are being organized periodically in India. The present workshop is one such activity organized by the Institute of Physics, Bhubaneswar in collaboration with the Saha Institute of Nuclear Physics, Kolkata during March 7–17, 2005 in the temple city of Puri, India. The aim of this workshop was to provide a platform for physicists working in the area of strong interaction at GeV energies. It was expected that these deliberations could lead to further collaborations among theorists and experimentalists working in this area. Discussions on possible nuclear physics applications of the forthcoming electron accelerator facility (INDUS II) in Indore, India was also initiated during the workshop. The workshop included a large number of invited talks, including some review talks, by expert theoreticians and experimentalists, and some short talks by other participants. Summaries of a few important talks are given below.

Prof. A Hosaka reviewed the current status of the exotic pentaquark baryons. After a brief look at experiments of both positive and negative results, he discussed theoretical methods to explain structure and reactions of the pentaquarks. He used several quark models to explain the structure of the pentaquarks in terms of quarks. He discussed the production reactions of pentaquark (Θ^+) which provide links between the theoretical models and experimental information. Also he discussed photoproductions and hadron-induced reactions which are useful to explore the nature of pentaquark (Θ^+).

Prof. E Oset made an introduction to chiral unitary theory applied to the meson–baryon interaction and showed that several well-known resonances are dynamically generated, and others are predicted. In the recent experimental data analysis he pointed out the existence of two $\Lambda(1405)$ states and it has provided support for the $\Lambda(1520)$ resonance as a quasibound state of $\Sigma(1385)\pi$. He emphasized that the use of chiral Lagrangians to account for the hadronic interaction at the elementary level introduces a new approach to deal with the modification of meson and baryon properties in a nuclear medium.

Prof. U Mosel gave a nice motivation for the investigations of in-medium properties of hadrons. Then he discussed the relevant symmetries of QCD and showed how they might affect the observed hadron properties. Also he discussed at length the observable consequences of in-medium changes of hadronic properties in reactions with elementary probes, and in particular photons, on

nuclei, where, he put an emphasis on new experiments on changes of the σ and ω mesons in medium.

Prof. V Metag discussed the recent experimental results on the modification of hadron properties in a nuclear medium. He described the experiments using hadron, heavy-ion, and photon beams, particularly emphasizing the photonuclear production of light vector and scalar mesons off nuclei. At the end he presented the recent results on the search for meson-nucleus bound states.

On the whole, the proceedings provides a rich source of information on the theoretical developments and experimental set-up for detailed investigations in the field. This proceedings should be of interest and help to a wide variety of students and researchers in nuclear physics.

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