Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

A Mechanism for Formation of Narrow Hadronic Resonances NAFTALI AUERBACH, Tel Aviv University, VLADIMIR ZELEVINSKY, Michigan State University, ALEXANDER VOLYA, Florida State University — The observation of a narrow peak around the energy of 1540 MeV in the K+N system has caused considerable excitement and research activity. It was suggested that the observed peak represents a pentaquark resonance, the theta particle. Since this initial discovery many different experiments (about 10) have found the peak around this energy. However, in about the same number of experiments (usually using higher energy probes) the theta was not seen. Moreover, the experiments that do observe the theta peak often differ in the energy position of the resonance. The determination of the widths is difficult because of experimental limitations. Indirect considerations suggest that the width is smaller than 1 MeV. Altogether the state of the art in this field is waiting for data of better quality. In this work we discuss a mechanism that could produce narrow resonances due to interference effects. The mechanism suggested by authors in Phys. Lett. B 590 (2004) 45 is of generic nature and can accommodate various models for the states involved. The central point is that since one deals with a many-quark system a large number of many-body states can be formed which interact via various mechanisms including interference through decay. As a result of this interaction a number of narrow states is generated, superimposed on a very wide resonance(s) which makes up the background. This is similar to the formation of giant resonances in nuclear physics.

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Date submitted: 10 May 2005 Electronic form version 1.4