Department of Theoretical Physics

Special Free Meson Seminar

Speaker	:	Alberto Martinez (Yukawa Institute for Theoretical Physics, Japan)
Topic	:	Study of the KD, ηD_s coupled system in a finite volume and the $D_{s*0}(2317)$ resonance
Day, Date & Time	:	Tuesday, November 15, 2011 at 11:00 a.m.
Place	:	Lecture Theatre (AG66)

Abstract

An SU(4) extrapolation of the chiral unitary theory in coupled channels is utilized to study the scalar mesons in the charm sector, and it is further extended to produce results in finite volume. The theory in the infinite volume produces dynamically the $D_{s*0}(2317)$ resonance by means of the coupled channels KD, ηD_s. Energy levels in the finite box are evaluated and, assuming that they would correspond to lattice results, the inverse problem of determining the bound states and phase shifts in the infinite volume from the lattice data is solved. We observe that it is possible to obtain accurate KD phase shifts and the position of the $D_{s*0}(2317)$ state, but it requires the explicit consideration of the two coupled channels in the analysis if one goes close to the ηD_s threshold. We also show that a careful analysis of the finite volume data can shed some light on the nature of the $D_{s*0}(2317)$ resonance as a KD molecule or otherwise.

(Nilmani Mathur)