CERN Joint EP/PP Seminars

SPEAKER: Kai-Feng Chen (Physics Department - National Taiwan University (NTU))

TITLE: **Difference in direct charge-parity violation between charged and neutral B meson decays**

DATE: Tue 29/04/2008 16:30

PLACE: Main Auditorium **

ABSTRACT

Equal amounts of matter and antimatter are predicted to have been produced in the Big Bang, but our observable Universe is clearly matter-dominated. One of the prerequisites1 for understanding this elimination of antimatter is the nonconservation of charge-parity (CP) symmetry. So far, two types of CP violation have been observed in the neutral K meson (K0) and B meson (B0) systems: CP violation involving the mixing between K0 and its antiparticle (and likewise for B0 and B0bar), and direct CP violation in the decay of each meson. The observed effects for both types of CP violation are substantially larger for the B0 meson system. However, they are still consistent with the standard model of particle physics, which has a unique source9 of CP violation that is known to be too small10 to account for the matter-dominated Universe. Here we report that the direct CP violation in charged BK0 decay is different from that in the neutral B0 counterpart. The direct CP-violating decay rate asymmetry, (that is, the difference between the number of observed B-K-0 event versus B+ to K+ pi0 events, normalized to the sum of these events) is measured to be about +7%, with an uncertainty that is reduced by a factor of 1.7 from a previous measurement. However, the asymmetry for versus B0 to K+pi- is at the -10% level. Although it is susceptible to strong interaction effects that need further clarification, this large deviation in direct CP violation between charged and neutral B meson decays could be an indication of new sources of CP violation which would help to explain the dominance of matter in the Universe.

Organised by: Maria Spiropulu / PH ----------**

Tea and coffee will be served at 16:00