Contribution ID: **64** Type: **Parallel Sessions**

Tetraquark interpretation of the charged Bottomonium-like states $Z_b^{\pm}(10610)$ and $Z_b^{\pm}(10650)$ and implications

Thursday, 5 July 2012 11:00 (15 minutes)

We present a tetraquark interpretation of the charged bottomonium-like states $Z_b^{\pm}(10610)$ and $Z_b^{\pm}(10650)$, observed by the Belle collaboration in the $\pi^{\pm}\Upsilon(nS)$ $(n = 1, 2, 3)$ and $\pi^{\pm}h_b(mP)$ $(m = 1, 2)$ invariant mass spectra from the data taken near the peak of the $\Upsilon(5S)$. In this framework, the underlying processes involve the production and decays of a vector tetraquark $Y_b(10890)$, $e^+e^- \to Y_b(10890) \to [Z_b^{\pm}(10610)\pi^{\mp}, Z_b^{\pm}(10650)\pi^{\mp}]$ followed by the decays $[Z_b^{\pm}(10610), Z_b^{\pm}(10650)] \to \pi^{\pm}\Upsilon(nS), \pi^{\pm}h_b(mP)$. Combining the contributions from the meson loops and an effective Hamiltonian, we are able to reproduce the observed masses of the $Z_b^{\pm}(10610)$ and $Z_b^{\pm}(10650)$. The analysis presented here is in agreement with the Belle data and provides crucial tests of the tetraquark hypothesis. We also calculate the corresponding meson loop effects in the charm sector and find them dynamically suppressed.The charged charmonium-like states $Z_c^{\pm}(3752)$ and $Z_c^{\pm}(3882)$ can be searched for in the decays of the $J^{PC} = 1^{--}$ tetraquark state $Y(4260)$ via $Y(4260) \to Z_c^{\pm}(3752)\pi^{\mp}$ and $Y(4260) \to Z_c^{\pm}(3882)\pi^{\mp}$, with the subsequent decays $(Z_c^{\pm}(3752), Z_c^{\pm}(3882)) \to (J/\psi, h_c)\pi^{\pm}$.

Primary author: Dr WANG, Wei (DESY (DE))

Co-authors: Prof. ALI, Ahmed (DESY); Dr HAMBROCK, Christian (Univ. Dortmund, Germany)

Presenter: Dr WANG, Wei (DESY (DE))

Session Classification: TR5 & TR7 - Room 220 - B Physics and CP Violation, etc.

Track Classification: Track 7. CP Violation, CKM, Rare Decays, Meson Spectroscopy