Contribution ID: **32** Type: **not specified**

$\bar{D}\Sigma_c^*$ and $\bar{D}^*\Sigma_c$ interactions and the LHCb hidden-charmed pentaquarks

Wednesday, 27 July 2016 14:15 (30 minutes)

Recently, two hidden-charmed resonances $P_c(4380)$ and $P_c(4450)$ consistent with pentaquark states were observed at the LHCb detector. The two P_c states locate just below the $\bar{D}\Sigma_c^*$ and $\bar{D}^*\Sigma_c$ thresholds with mass of gaps about 5 and 15 MeV, respectively. Inspired by this fact we perform a dynamical investigation about the $\bar{D}\Sigma_c^*(2520)$ and $\bar{D}^*\Sigma_c(2455)$ interactions which are described by the meson exchanges. A bound state which carries spin-parity $J^P = 3/2^-$ is produced from the $\bar{D}\Sigma_c^*(2520)$ interaction, which is consistent with the $P_c(4380)$ observed at the LHCb detector. From the $D^*\Sigma_c(2455)$ interaction, a bound state with $5/2^+$ is produced, which can be related to the $P_c(4450)$. The results suggest that the $P_c(4380)$ and $P_c(4450)$ are good candidates of $\bar{D}\Sigma_c^*(2520)$ and $\bar{D}^*\Sigma_c(2455)$ molecular states, respectively.

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Session Classification: Pentaquarks