Contribution ID: **61** Type: **Parallel talk**

Hidden sector behind the CKM matrix

Thursday, 22 June 2017 15:15 (15 minutes)

The small quark mixing, described by the Cabibbo-Kobayashi-Maskawa (CKM) matrix in the Standard Model, may be a clue to reveal new physics around the TeV scale.
We consider a simple scenario that extra particles in a hidden sector radiatively
mediate the flavor violation to the quark sector around the TeV scale and effectively realize the observed CKM matrix.
The lightest particle in the hidden sector, whose contribution to
the CKM matrix is expected to be dominant, is a good dark matter (DM) candidate.
There are many possible setups to describe this scenario, so that we investigate
some universal predictions of this kind of model, focusing on the contribution of DM to the quark mixing and flavor physics. In this scenario, there is an explicit relation between the CKM matrix
and flavor violating couplings, such as four-quark couplings, because both are radiatively induced by the particles in the hidden sector. Then, we can explicitly find the DM mass region and the size of Yukawa couplings between the DM and quarks, based on the study of flavor physics and DM physics. In conclusion, we show that DM mass in our scenario is around the TeV scale, and the Yukawa couplings are between $calO(0.01)$ and $calO(1)$.
The spin-independent DM scattering cross section is estimated as $calO(10^{-9})$ [pb]. An extra colored particle is also predicted at the $calO(10)$ TeV scale.

Presentation type

Parallel talk

Primary author: OMURA, Yuji (KMI, Nagoya University)

Co-author: Mr OKAWA, Shohei (Nagoya University)

Presenter: OMURA, Yuji (KMI, Nagoya University)

Session Classification: Parallel IV