

# PASCOS 2016: 22nd International Symposium on Particles, Strings and Cosmology



Contribution ID: 205

Type: **not specified**

## A Model of Heavy QCD Axion and the LHC Signature

*Wednesday 13 July 2016 09:30 (20 minutes)*

As Rubakov suggested in 1997, an QCD axion can be heavy if there is a copy of the Standard Model and a Peccei-Quinn symmetry is realized between it and the Standard Model.

Following that idea, we construct a concrete model which satisfies the cosmological consistency.

Then, some of the resultant particles can be around the region which is accessible by the LHC. We point out that the dilaton in our model can play a role of the diphoton signal. Although the dilaton-photon-photon coupling is weaker than the dilaton-axion-axion one, an axion is much lighter than a dilaton and the two photons from an axion is quite collimated, mimicking a photon signal.

We also investigate how to distinguish this mimicking signal in a preparing work. Using the information from the tracker, we conclude that using some kinds of distributions, it is possible to reveal the property.

### Summary

We have constructed a model of heavy QCD axion in 1504.06084 and a preparing paper and discussed the LHC signature associating it with the diphoton signal in 1602.07909 and one in preparation.

In the talk, I will review how we can make an axion heavy and the validity of the LHC signature.

**Primary author:** FUKUDA, Hajime (The University of Tokyo)

**Co-authors:** Prof. CHIANG, Cheng-Wei (National Central University, Taiwan); Prof. IBE, Masahiro (ICRR, The University of Tokyo); JINNOUCHI, Osamu (Tokyo Institute of Technology (JP)); Prof. YANAGIDA, Tsutomu (Kavli IPMU, The University of Tokyo); NOJIRI, mihoko (KEK)

**Presenter:** FUKUDA, Hajime (The University of Tokyo)

**Session Classification:** Parallel II

**Track Classification:** Physics at Colliders