



Contribution ID: 43

Type: **Poster presentation**

Combination of ATLAS dark matter searches interpreted in a 2HDM with a pseudo-scalar mediator using 139 fb⁻¹ of $\sqrt{s} = 13$ TeV pp collision data

Tuesday, July 18, 2023 6:35 PM (5 minutes)

The existence of dark matter (DM) is carried by a variety of astrophysical measurements, however the nature and properties of the DM are still largely unidentified. The presence of DM is not predicted by the Standard Model (SM), but many theories beyond the Standard Model (BSM) offer the study of DM. Weakly Interacting Massive Particles (WIMPs, denoted as χ) are frequently used as candidates in several of these theoretical models. If Dark Matter interacts weakly with the Standard Model (SM) it could be produced at the Large Hadron Collider (LHC) experiments, escaping the detector and leaving a large missing transverse momentum as its signature. WIMPs are potentially pair-produced in pp collisions at the Large Hadron Collider (LHC). To identify events with DM, additional SM particle(s) (Z, W and h bosons, jet, quarks...) need to be produced in association with DM in a pp collision. The above-mentioned searches, as well as resonance searches looking for mediators decaying into SM particles, are interpreted in the context of so-called Two-Higgs-Doublet Model (2HDM) with a pseudo-scalar mediator (2HDM+a), which is the simplest UV-complete benchmark with a pseudo-scalar mediator. Many interesting results using the LHC Run 2 pp collision data collected at 13 TeV with an integrated luminosity of 139 fb⁻¹ have been achieved. Since no significant excess over the expected SM background was found in any of these analyses, the results provide constraints on 2HDM+a benchmark. In addition, a statistical combination is performed of three of the most sensitive analyses: $E_{T\text{miss}} + Z(\ell\ell)$, $E_{T\text{miss}} + h(bb)$, and H_{tb} signatures.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

ATLAS

Is the speaker for that presentation defined?

No

Details

N/A

Internet talk

Maybe

Author: PETERS, Krisztian (Deutsches Elektronen-Synchrotron (DE))

Co-author: EZZARQTOUNI, Sanae (Universite Hassan II, Ain Chock (MA))

Presenter: EZZARQTOUNI, Sanae (Universite Hassan II, Ain Chock (MA))

Session Classification: Poster Session

Track Classification: Main topics: High Energy Particle Physics