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Active Learning application in a dark matter search with ATLAS PanDA and iDDS

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Active learning techniques can enhance efficiency in new physics searches. To demonstrate this an extended two dimensional search using an active learning technique with a preserved analysis is presented. This preserved analysis searches for a dark-Z boson in four-lepton final states. Bayesian optimization is applied in the active learning process to look for the maximal difference between the observed limit and expected limit (the excess). The work is conducted using a newly developed computing model as a part of the ATLAS workload management system PanDA with the intelligent Data Delivery Service (iDDS) as an orchestrator. The system is integrated in the ATLAS distributed computing ecosystem, seamlessly accessing ATLAS data via the ATLAS data management system Rucio and software distributed via the CernVM-File System (CVMFS). No evidence of new physics is found and upper limits on the production cross section of H⟶ZZdark⟶4lepton are set. The excesses around the Zdark masses at m_Zdark=20 GeV and 40 GeV seen in the original analysis are reconfirmed, along with the mild excesses around 30 GeV and 50 GeV.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

ATLAS

Is the speaker for that presentation defined?

No

Details

to be selected by the ATLAS Speakers Committee

Internet talk

Maybe

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