1. Record Nr. UNINA9910155332203321

Autore	Schramm Steven
Titolo	Searching for Dark Matter with the ATLAS Detector / / by Steven Schramm
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
ISBN	9783319444536
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (XXIII, 324 p. 145 illus., 135 illus. in color.)
Collana	Springer Theses, Recognizing Outstanding Ph.D. Research, , 2190-5053
Disciplina	530.072
Soggetti	Particles (Nuclear physics) Quantum field theory Cosmology Gravitation Elementary Particles, Quantum Field Theory Classical and Quantum Gravitation, Relativity Theory
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Introduction -- Contributions -- Theoretical Background and Motivation for Dark Matter -- The ATLAS Experiment -- ATLAS Reconstruction and Performance -- Jet Reconstruction and Performance -- The Mono-jet Analysis -- Mono-jet Dark Matter Interpretation -- Mono-jet Prospects at an Upgraded LHC -- Conclusions. .
Sommario/riassunto	This thesis describes the search for Dark Matter at the LHC in the mono-jet plus missing transverse momentum final state, using the full dataset recorded in 2012 by the ATLAS Experiment. It is the first time that the number of jets is not explicitly restricted to one or two, thus increasing the sensitivity to new signals. Instead, a balance between the most energetic jet and the missing transverse momentum is required, thus selecting mono-jet-like final states. Collider searches for Dark Matter have typically used signal models employing effective field theories (EFTs), even when comparing to results from direct and indirect detection experiments, where the difference in energy scale renders many such comparisons invalid. The thesis features the first

robust and comprehensive treatment of the validity of EFTs in collider searches, and provides a means by which the different classifications of Dark Matter experiments can be compared on a sound and fair basis.