

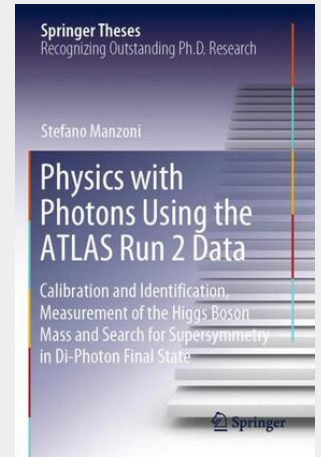
Manzoni

Physics with Photons Using the ATLAS Run 2 Data

Calibration and Identification, Measurement of the Higgs Boson Mass and Search for Supersymmetry in Di-Photon Final State

The work presented in this book is based on the proton-proton collision data from the Large Hadron Collider at a centre-of-mass energy of 13 TeV recorded by the ATLAS detector in 2015 and 2016. The research program of the ATLAS experiment includes the precise measurement of the parameters of the Standard Model, and the search for signals of physics beyond the SM. Both these approaches are pursued in this thesis, which presents two different analyses: the measurement of the Higgs boson mass in the di-photon decay channel, and the search for production of supersymmetric particles (gluinos, squarks or winos) in a final state containing two photons and missing transverse momentum. Finally, ATLAS detector performance studies, which are key ingredients for the two analyses outlined before, are also carried out and described.

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