

Abstract: This thesis presents the measurement of the differential cross section of the top-antitop pair production in proton-proton collisions at center-of-mass energy of 8 TeV at the ATLAS experiment. The measurement is performed for top-antitop events in the single lepton decay channel in the boosted topology. The measured differential cross section is expressed as a function of the top quark transverse momentum at particle level and at parton level. The measured distributions are compatible with the theoretical predictions of the Standard Model. The experimental techniques used in this measurement are discussed with emphasis on the jet reconstruction and on the identification of jets originating from b-quark fragmentation. The jet reconstruction is influenced by simultaneous proton-proton collisions (pileup), and the mitigation of these pileup effects is studied. A novel pileup subtraction technique for jets is proposed using an extension of the methods currently being employed by the LHC experiments. The new method has a good performance in removing the pileup contributions at the level of jet constituents.