

Abstract: The analysis of the Higgs boson decay $H^0 \rightarrow \tau^+\tau^-$ is presented, assuming only the leptonic tau decays. The analysis is based on the proton – proton collision data recorded at the ATLAS experiment at the LHC during the RUN2 period. The optimization process applied on the Monte Carlo simulation of the signal and background data channels resulted in finding the optimal selection criteria, as follows: a sum of leptons' transversal momentum, a minimum of the most energetic jet's transversal momentum (originating from H^0 production), an azimuthal angle between two leptons and a threshold missing transversal energy (in this order). The analysis follows the assumptions of a collinear approximation enabling the Higgs boson mass calculation.