



ΕΚΤΑΚΤΗ ΟΜΙΛΙΑ
ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

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*«Tau leptons as a discovery tool for Higgs
and (B)SM physics with the CMS @LHC»*

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ZOOM Link

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ΠΕΡΙΛΗΨΗ

The discovery of the Higgs boson in 2012 at the LHC by both ATLAS and CMS experiments, has propelled us to a new era for particle physics, with the characterization of this new particle being of the utmost importance. The tau lepton that was discovered more than four decades ago, is the heaviest lepton and it can decay to lighter leptons or hadrons; still, in a collider environment, its experimental signature can be easily misidentified as gluon or quark jets. Moreover, as the tau lepton has the second highest decay rate of the Higgs boson decaying to fermions, it is a potent tool for measuring the Yukawa coupling to fermions. That makes tau lepton highly valuable not only to decode and unravel the characteristics of the Higgs boson, but also to possibly probe production mechanisms with a small production cross-section, and potentially even measure the self-Higgs coupling. Furthermore, final states with tau leptons appear in many beyond-the-standard-model (BSM) theories. In this talk, we discuss recent results on both Higgs boson measurement and BSM searches involving tau leptons, as well as give a glimpse of prospects for exploring both the Higgs sector and BSM physics at the HL-LHC and beyond.