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The reconstruction and identification of hadronically decaying tau leptons at ATLAS

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Tau leptons play an important role in the physics program at the LHC. They are used not only in searches for new phenomena like the Higgs boson or Supersymmetry and electroweak measurements but also in detector related studies like the determination of the missing transverse energy scale. Optimal identification of hadronically decaying tau leptons is achieved by using detailed information from tracking and calorimeter detector components. Variables describing the properties of calorimeter energy deposits and track reconstruction within tau candidates are combined in multi-variate discriminants, to achieve high rejection against backgrounds. The identification efficiencies are measured by W to tau nu and Z to tau tau events, and compared with the prediction of the Monte Carlo simulation. The energy scale uncertainties for tau leptons are determined by investigating single hadron calorimeter response, as well as kinematic distributions in Z to tau tau events.

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