

## 論文の内容の要旨

論文題目 Precise Calculation of the Mass Splitting between Neutral and Charged Winos  
(荷電ウィーノと中性ウィーノの質量差の精密計算)

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After the discovery of the Higgs boson with a mass of around 125 GeV, supersymmetric model with 10-100 TeV scalar particles based on anomaly mediation attracts people's attention. Such a model often predicts that neutral wino is the lightest supersymmetric particle. Its mass is degenerated to a mass of charged wino at tree level, and the mass splitting between them are generated by a radiative correction. Therefore, small mass splitting is predicted, and charged wino becomes a long lived particle with life time being 0.1-1 ns. Life time of charged wino is an important parameter in a collider search at the LHC experiment, and it strongly depends on mass splitting. Therefore, it is important to calculate the mass splitting including higher order radiative corrections. In this thesis, we calculated mass splitting between neutral and charged winos at two-loop level. We found two-loop correction reduced the mass splitting by a few MeV, and it makes life time of charged wino 10-30 % longer, and the constraint on the chargino mass is raised about 10 GeV.