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Estimation and reduction of the biases by the galactic magnetic field on the UHECR correlation studies

We estimate the biases caused by the coherent deflection due to the galactic magnetic field (GMF) in the previous maximum-likelihood analysis for searching the UHECR sources (Aab et al. 2018, Abbasi et al. 2018). We generate the mock event datasets with a set of assumptions for the starburst galaxy (SBG) source model, coherent deflection by a GMF model , and the mixed-mass composition, then conducted a maximum-likelihood analysis with ignorance of the GMF in the same manner as previous studies. We find that the anisotropic fraction f_{ani} is estimated systematically lower than the true value when we ignore the effect caused by the GMF. We estimate the true parameters which reproduce the best-fit parameters reported in Aab et al. (2018). We also develop the maximum-likelihood method with consideration of the GMF model and confirm that the estimated parameters would be improved. In this talk we also discuss about the apprication of the method to the observational datasets obtained from the Telescope Array and Auger experiments.

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