

Monte Carlo Bayesian search for the plausible source of the Telescope Array hotspot

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The Telescope Array (TA) collaboration has reported a hotspot of 19 ultrahigh-energy cosmic rays (UHECRs). Using a universal model with one source and energy-dependent magnetic deflections, we show that the distribution of the TA hotspot events is consistent with a single source hypothesis, although multiple sources cannot be ruled out. The chance probability of this distribution arising from a homogeneous distribution is 0.2%. We describe a Monte Carlo Bayesian (MCB) inference approach, which can be used to derive parameters of the magnetic fields as well as the source coordinates, and we apply this method to the TA hotspot data, inferring the location of the likely source. We discuss possible applications of the same approach to future data.

Presentation type

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Author: HE, Hao-Ning (UCLA)

Presenter: HE, Hao-Ning (UCLA)

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