

The Possible Extragalactic Source of Ultra-High-Energy Cosmic Rays at the Telescope Array Hotspot

Monday, 26 October 2015 18:30 (20 minutes)

The Telescope Array (TA) collaboration has reported a hotspot of 19 ultrahigh-energy cosmic rays (UHECRs), offering an opportunity to study their origin. 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, and that the chance probability of this distribution appearing 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.

Primary author: Dr HE, Haoning (PMO/UCLA)

Co-authors: Prof. KUSENKO, Alexander (UCLA/Kavli IPMU); Dr ZHANG, Bin-Bin (Univ. of Alabama); Dr YANG, Rui-Zhi (MPIK); Dr NAGATAKI, Shigehiro (RIKEN); Dr FAN, Yi-Zhong (PMO)

Presenter: Dr NAGATAKI, Shigehiro (RIKEN)

Session Classification: Cosmic Rays

Track Classification: Ultra High Energy Cosmic Rays