

Polarized emission around the M87 supermassive black hole



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Abstract:

In 2017 April, the Event Horizon Telescope (EHT) observed the near-horizon region around the supermassive black hole at the core of the M87 galaxy. These 1.3 mm wavelength observations revealed a compact asymmetric ring-like source morphology. This structure originates from synchrotron emission produced by relativistic plasma located in the immediate vicinity of the black hole. Now we present the corresponding linear-polarimetric EHT images of the center of M87. We find that only a part of the ring is significantly polarized. The resolved fractional linear polarization has a maximum located in the southwest part of the ring, where it rises to the level of $\sim 15\%$. The polarization position angles are arranged in a nearly azimuthal pattern. We will discuss the polarimetric data reduction and analysis methodology. The polarimetric images carry information about the structure of the magnetic fields responsible for the synchrotron emission. We will discuss the theoretical implications of these observations.



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