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Event Horizon Telescope Paper VII: imaging the polarized emission around M 87*

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In 2017, the Event Horizon Telescope (EHT) observed the supermassive black hole M 87 at the center of the giant elliptical galaxy Messier 87 using very-long baseline interferometry between a global network of radio telescopes. Operating at a high radio frequency of 230 GHz, EHT enables imaging of the optically thin emission region in the immediate vicinity of the event horizon of M 87, achieving resolution of ~ 3 Schwarzschild radii. Recently, the first images of the linearly polarized emission component were published. They indicate that only a part of the M 87 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. Properties of the compact emission were characterized and evidence for the temporal evolution of the polarized source structure over one week of EHT observations was found. I will present the challenges of polarimetric calibration and imaging and strategies to mitigate them with a variety of analysis tools. Then I will discuss the morphology of the polarimetric images of the M 87 and derived quantities characterizing these images, which enabled the theoretical interpretation of these results.

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