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The most complete multi-wavelength view of M87 to date: the 2017 campaign

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In 2017, the Event Horizon Telescope (EHT) Collaboration successfully imaged the black hole at the center of the M87 galaxy. At the same time, an extensive multi-wavelength campaign was conducted involving ground and space-born instruments to cover energies from radio to very-high energy (VHE) gamma rays. We found that the core of M87 and the innermost knot HST-1 are in historically low states. In terms of X-ray energies, the core flux dominates over HST-1. We present the most extensive quasi-simultaneous spectral energy distribution (SED) and discuss the challenges of combining data with vastly different spatial resolutions. By modeling the broadband spectrum with two different types of single-zone leptonic models, we can infer that the low-state gamma-ray emission via inverse Compton must originate from a different region than the millimeter-band emission. We conclude that the gamma rays can only be generated in the inner jet if there are strongly particle-dominated regions upstream of HST-1. Our collected data has been made open access, and we encourage the application of structured jet models on these data.

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