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Parameter Extraction for Black Hole Images with Neural Networks[1]

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Event Horizon Telescope (EHT) has recently released the first horizon-scale images of the black hole in M87. Combined with other astronomical data these images limit the mass and spin of the hole as well as the accretion rate and trapped magnetic flux in the surrounding accretion flow. An important question for EHT is how well these key parameters can be extracted from present and future EHT data alone. Following earlier work by Van der Gucht et al., we explore parameter extraction using a neural network. Using training and test sets derived from a suite of state of the art simulations, we consider the discriminating power of individual total intensity images at various resolutions, small sets of images corresponding to sequential observations, and full polarization images at various resolutions.

[1]FGSA