

Abstract Submitted
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Polarized Imaging for Reionization, with an Application to HERA JENNIFER LOCKE, University of Pennsylvania, JAMES AGUIRRE, University of Pennsylvania, HERA, ZACHARY MARTINOT, JIANRONG TAN, KAE-LYN DAUER, ADRIANA GAVIDIA, HERA, ALEXANDER SEIDEL, GONZALO TUCKER, University of Pennsylvania, HERA, HERA COLLABORATION — A continuing source of uncertainty for Epoch of Reionization (EoR) measurements is the degree to which polarized foregrounds (and imperfect accounting of the polarized response of the instrument) will contaminate the measurement of the unpolarized EoR signal. Measuring and characterizing polarized emission at low radio frequencies requires good models of the intrinsic polarized signal from extragalactic and Galactic sources, the rotation measure structure of the Galactic ISM, and others, combined with the ability incorporate all of these effects into fully-polarized visibility simulation and calibration. While HERA is not optimized for imaging, given the highly redundant array configuration, we have nevertheless made significant progress in modeling the full polarization response of the antenna and feed, and incorporating this into realistic simulations of the measured visibilities. We discuss the current difficulties with models of source emission rotation measure, and how we have incorporated the ionosphere into our simulations. We also discuss success thus far with a custom calibration approach. We explore correcting for the primary beam using both an image-based, least-squares solution for the Stokes images, as well as deconvolution using tools from CASA.

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