

Abstract Submitted  
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**The Polarized Image of Fluid Orbiting a Kerr Black Hole<sup>1</sup>**

ZACHARY GELLES, Center for Astrophysics — Harvard and Smithsonian, ELIZABETH HIMWICH, Center for the Fundamental Laws of Nature, Harvard University, DANIEL PALUMBO, MICHAEL JOHNSON, RAMESH NARAYAN, Center for Astrophysics — Harvard and Smithsonian — We present a semi-analytic model to compute the polarized image of equatorial synchrotron emission near a Kerr black hole. For face-on viewing inclinations, we show that the geometrical effect of spin on the observed polarization is subleading, suggesting that astrophysical properties of the accretion flow and plasma are primarily responsible for differences seen in ray-traced images of general relativistic magnetohydrodynamic simulations. We also present numerical results for large inclination angles, at which the effects of spin become more apparent. As an additional application of our model, we analyze the polarized appearance of hotspots orbiting on equatorial geodesics. We demonstrate that the linear polarization exhibits distinct signatures for different field configurations and inclination angles, and we compare our results to previous modelling efforts and to radio and near-infrared observations of the Galactic Center supermassive black hole, Sgr A\*.

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