

Abstract Submitted  
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**Non-Dipolar Magnetic Fields in Millisecond Pulsars: From NICER Data to Models** CONSTANTINOS KALAPOTHARAKOS, University of Maryland, College Park, ALICE HARDING, ZORAWAR WADIASINGH, DEMOS KAZANAS, NASA Goddard Space Flight Center — Recent NICER results suggest substantial deviations from the commonly assumed purely dipolar magnetic field geometry in the millisecond pulsar J0030+0451. We will present vacuum and force-free models corresponding to the sum of off-center dipole and quadrupole magnetic moments that reproduce the hot-spots indicated by the NICER results. We will discuss the broader implications of this study that are related to the physical processes that produce the magnetic fields and the pair cascades near the stellar surface. Finally, we will show that a global model using the NICER-implied field structure can self-consistently reproduce the Fermi gamma-ray light curve of this pulsar.

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