

Abstract Submitted  
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**Is the anisotropy of the upper critical field of  $\text{Sr}_2\text{RuO}_4$  consistent with a helical  $p$ -wave state?** RICHARD KLEMM, Univ of Central Florida, JINGCHUAN ZHANG, QIANG GU, University of Science and Technology Beijing, CHRISTOPHER LOERSCHER, Univ of Central Florida — We calculate the angular and temperature  $T$  dependencies of the upper critical field  $H_{c2}(\theta, \phi, T)$  for the  $C_{4v}$  point group helical  $p$ -wave states, assuming a single uniaxial ellipsoidal Fermi surface, Pauli limiting, and strong spin-orbit coupling that locks the spin-triplet  $\vec{\mathbf{d}}$ -vectors onto the layers. Good fits to the  $\text{Sr}_2\text{RuO}_4$   $H_{c2,a}(\theta, T)$  data of Kittaka et al. [2009 Phys. Rev. B 80, 174514] are obtained. Helical states with  $\vec{\mathbf{d}}(\mathbf{k}) = \hat{\mathbf{k}}_x \hat{\mathbf{x}} - \hat{\mathbf{k}}_y \hat{\mathbf{y}}$  and  $\hat{\mathbf{k}}_y \hat{\mathbf{x}} + \hat{\mathbf{k}}_x \hat{\mathbf{y}}$  (or  $\hat{\mathbf{k}}_x \hat{\mathbf{x}} + \hat{\mathbf{k}}_y \hat{\mathbf{y}}$  and  $\hat{\mathbf{k}}_y \hat{\mathbf{x}} - \hat{\mathbf{k}}_x \hat{\mathbf{y}}$ ) produce  $H_{c2}(90^\circ, \phi, T)$  that greatly exceed (or do not exhibit) the four-fold azimuthal anisotropy magnitudes observed in  $\text{Sr}_2\text{RuO}_4$  by Kittaka et al. and by Mao et al. [2000 Phys. Rev. Lett. 84, 991], respectively.

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