Anisotropic vortex structure in tilted magnetic fields in the spin triplett superconductor Sr$_2$RuO$_4$ VOICU OCTAVIAN DOLOCAN, CRTBT-CNRS, YING LIU, Pennsylvania State University, PASCAL LEJAY, CRTBT-CNRS, DOMINIQUE MAILLY, LPN-CNRS, KLAUS HASSELBACH, CRTBT-CNRS, CRTBT-CNRS COLLABORATION, PENNSYLVANIA STATE UNIVERSITY COLLABORATION, LPN-CNRS COLLABORATION — Using a μSQUID microscope we imaged magnetic flux above the ab surface in the unconventional anisotropic superconductor Sr$_2$RuO$_4$, at temperatures between 0.4 K and 1.3 K and magnetic fields between 0 to 70 gauss at various angles. We observed vortex chains as well as coexistence of vortices and chains for tilted fields. The distance between the chains varies as 1/B. The mass anisotropy expressed as the ratio of the penetration depth ($\lambda_c/\lambda_{ab}$) is about 20 for Sr$_2$RuO$_4$, situating Sr$_2$RuO$_4$ in respect of anisotropy between YBCO and BSCCO. We’ll discuss the different origins for vortex chain formation for these three superconductors. In the case of Sr$_2$RuO$_4$ we can successfully describe the ordering of the flux into vortex chains using Ginzburg-Landau theory.

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