High spatial resolution polarimetric observations of hydroxyl maser emission towards the massive star-forming region G351.417+0.645

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In this study, we present high spatial resolution polarimetric observations obtained with the Long Baseline Array (LBA) of both ground and excited state hydroxyl (OH) maser emission towards the massive star-forming region G351.417+0.645. Our results provide the first well-characterized spatial gradient magnetic field measurements for the ground state transitions. These show the magnetic field strengths vary between -5.7 and +4.2 mG (negative and positive signs represent the magnetic field directed towards and away from us respectively), and comparably -5.7 to +4.4 mG for the excited state, with a clear spatial separation in the positive and negative field directions. This clear spatial separation, which coincides with a separation along the Galactic plane, will be explained in relation to the star forming region. Furthermore, the kinematics and environmental conditions in an 11 year time span will be examined through a comparison with previous LBA observations.