

Magnetic Field, Kinematic and Physical Properties of G351.417+0.645 from high resolution observation of OH masers using LBA

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We observed OH masers towards the high-mass star-forming region G351.417+0.645 at ground- (1665- and 1667-MHz main lines and 1720-MHz satellite line) and excited-state (6030 and 6035 MHz) using the Australian Long Baseline Array (LBA) in 2012. High resolution of LBA enabled us to precisely measure magnetic field and kinematic properties and trace physical properties of this source. There are 21 and 23 Zeeman pairs detected at ground and excited states respectively providing magnetic field measurements between -6.4 and +4.4 mG. We found the same trend of a reversal of magnetic field from 1665- and 6035-MHz transitions. In comparison with previous LBA observation in 2001, there is no change in magnetic field strength and direction and radial velocity. We calculated internal proper motion with respect to the brightest features between those epochs (2001 and 2012) and found small downward motion from 50% of all the same maser features. Moreover, we also inferred the physical properties of this source from the coincidence of OH transitions at different location by comparing with the current OH models.