The Rotating Bipolar Outflow and Disk Structure of L1448 IRS 2

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A bipolar outflow is a common phenomenon in a large range of objects, from brown dwarfs to active galactic nuclei. On the other hand, it is the most energetic structure in star formation, which brings chemical complexity to young stellar objects. In spite of the generality and distinctness, little is yet known about the driving mechanism. Theoretical models have suggested that bipolar outflows are generated magneto-centrifugally, which indicates rotating bipolar outflows. However, there are no clear observational results showing rotation of bipolar outflows so far.

In order to study the driving mechanism, we have carried out a series of observations toward the young stellar object L1448 IRS 2 in various molecules such as CO, ^{13}CO, C^{18}O, HCO^+, and N_2H^+, using the Combined Array for Research in Millimeter-wave Astronomy (CARMA). Encouragingly, the data sets show signatures of the rotating bipolar outflow and disk structure of L1448 IRS 2. In this presentation, we show the observational results and discuss a possible driving mechanism. In addition, the distribution of molecules is addressed.