P132a Misaligned rotations of the envelope, outflow, and disks in the triplet protostellar system of VLA 1623−2417

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The rotation of a star-forming dense core is one of the most important parameters for star formation that has to be considered to study several components such as the jet-disk system as well as the molecular outflow.

We report a study of the low-mass Class-0 triplet System VLA 1623AB, in the Ophiuchus molecular cloud, by using $H^{13}CO^{+}(J=3-2)$, $CS(J=5-4)$, and $CCH(N=3-2)$ lines as a part of the ALMA Large Program FAUST. By focusing on velocity fields of these lines, we revealed the rotation motions in wide range scales from the envelope and the outflows to image the rotation of the circum-binary VLA 1623A disk as well as the VLA 1623B disk. We have found that the minor axis of the circumbinary disk of VLA 1623A is misaligned by about 12 degrees with respect to the large scale outflows and envelope rotation. The minor axis, i.e., the disk rotation axis, is parallel to the large scale magnetic filed. The misalignment suggests that gas rotation and magnetic field are inclined with each other. We have also found the velocity gradient along the major axis of VLA 1623B, which indicates that its rotation axis is opposite to the other rotation axes.