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Calculating Velocity to Find Distance to YellowBalls to Build a Catalogue That Aids the Research of Massive Star Formation[1] BEZAWIT MEKASHA KASSAYE, HRITIK RAWAT, KATHRYN DEVINE, College of Idaho
— YellowBalls (YBs) were first discovered by citizen scientists in mid-infrared images from the Spitzer Space Telescope. Their yellow color comes from a combination of green (8 μm) and red (24 μm) emission. The combined emission suggests ionization and heat, respectively, which are signs of newly forming massive or intermediate-mass stars. YBs are a potentially useful tool to expand our knowledge of star formation. We are building a catalog of YBs that includes their location, distance, size, color, mass, and luminosity, providing data for astronomers to use to learn more about YBs role in star formation. Distance is a crucial property to determine physical properties such as luminosity and size. I used data from the SEDIGISM and BU-GRS datasets to analyze ^{13}CO spectra at the locations of YBs. Doppler shift of the ^{13}CO lines indicates YB velocities. I then used the location of YBs in the Galactic plane along with Velocities in a distance calculator that combined a kinematic rotational model of the Milky Way and the Bayesian statistics to determine distance. I have determined the velocities and distances for ∼4000 YBs, which will be included in our final catalog.

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