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# Infrared Period-Luminosity Relations of Galactic Miras based on Multi-Epoch Photometry and the Gaia Parallax Precision

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Till date, period-luminosity relations of Galactic Miras are scarce in the literature because their distances were poorly known. This has changed with the advent of Gaia parallaxes. A further limitation is the lack of multi-epoch IR photometry for significant samples of Miras; single-epoch 2MASS photometry results in large scatter because of the stars' large amplitude variability. We combined several sources of data to improve on this: 3.6 years of observations with the COBE/DIRBE instrument in four IR photometric bands, multi-epoch observations with the WISE space observatory in two bands, and hand-picked pulsation periods based on visual AAVSO light curves of the stars. We present period-luminosity relations of Galactic Miras in these photometric bands and use the scatter around them to assess the precision of Gaia parallaxes of AGB stars. We find that they must be more precise than often reported in the literature.

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