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Gaia measurements of evolved stars refined using radio observations

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The recently published Gaia Data Release 3 has improved astrometric measurements for 1.7 billions stars including line-of-sight (los) velocities for more than 30 million objects using the Barycentric Celestial Reference System (BCRS). For a common sample of evolved O-rich Asymptotic Giant Branch (AGB) stars, radio observatories also measured the los velocities in the Kinematic Local Standard of Rest (LSRK). We compare the cross-match findings individually and analyze (1) the implications of any bias when los velocities from Gaia data are used providing an accurate transformation of los velocities between frames, and (2) how additional astrometric information can be obtained using statistical photometric methods to obtain a distances when inaccurate parallaxes do not allow a direct estimate.