The longest period Long Period Variables in the Magellanic Clouds

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VMC Survey

*The ESO public VISTA Magellanic Cloud (VMC) survey is a photometric survey in Y, J, and $K_{\rm S}$ performed at the VISTA telescope (Cioni et al. 2011).
*The VMC survey covers approximately 170 deg^2 of the Magellanic Cloud (MC) system and includes stars as faint as 22 mag in $K_{\rm S}$ (5σ, Vega mag).
*The main goals of the VMC survey are to derive the spatially resolved star formation history across the Magellanic system (Rubele et al. 2015, 2018) and to measure its three-dimensional geometry.
*Typically 12 observervations are taken over a 6 month period in $K_{\rm S}$. This cadence is very suited for deriving mean magnitudes for Cepheids and RR Lyrae stars, but also for longer period AGB stars, when combined with literature data.

AGB Variability

The largest single collection of known long period variables (LPVs) in the MCs is by the OGLE-III survey: 1663 / 352 Miras & 11132 / 2222 SRs in the LMC & SMC. The faintest 1% are between I= 20.2 - 20.7

OGLE-IV:
Data for LPVs not yet available.
Larger area, *but not deeper*.

The niche for IR surveys like VMC: Finding red (faint) LPVs that will not be detected by optical surveys.

Selection of Stars

- VMC only (requires J *and* K for reliability)
- VMC and WISE data ($K, W1, W2$)
- SAGE, then VMC ([3.6],[4.5],[5.8],[8.0])

3736 sources, 2014 unique

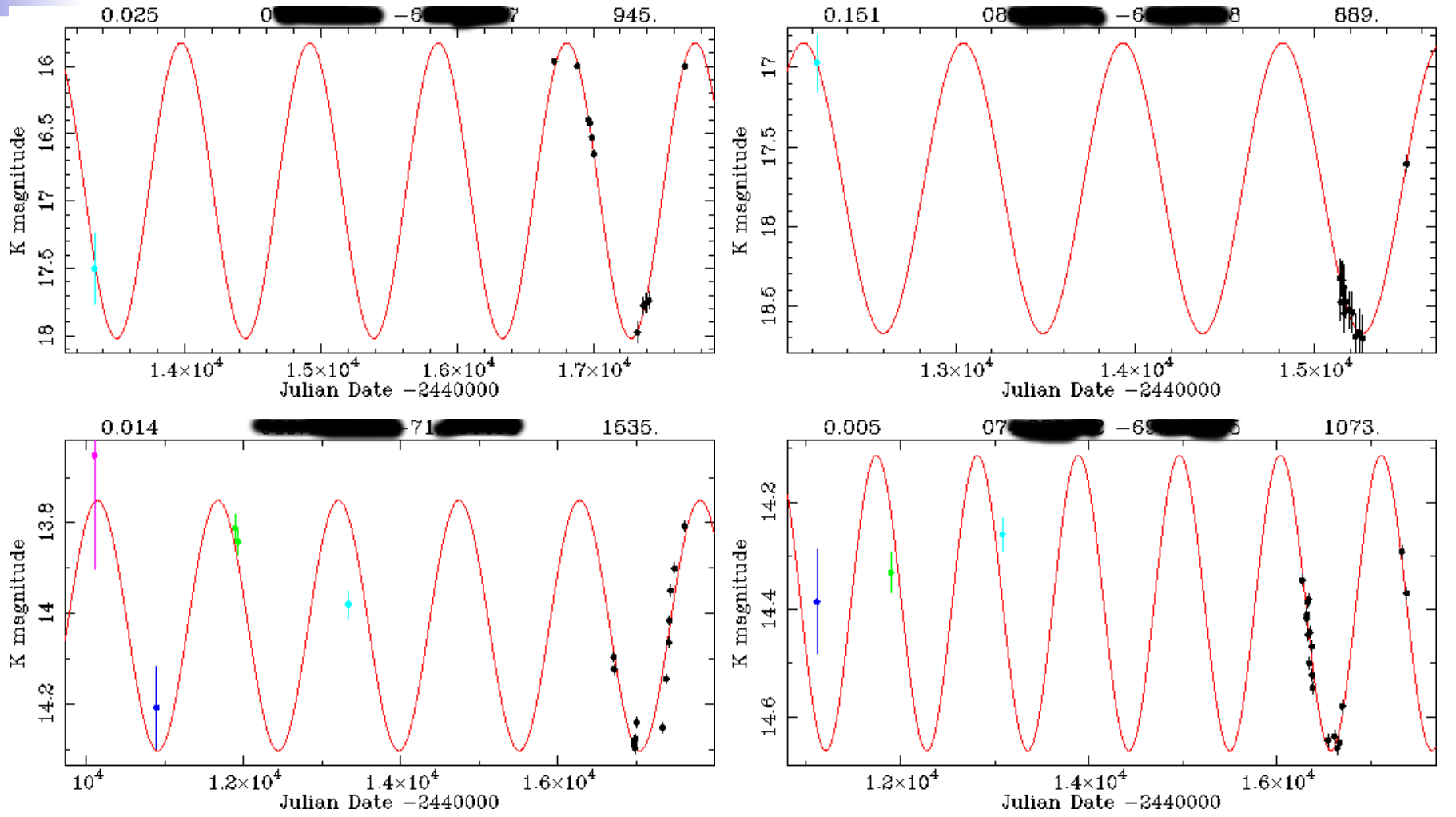
Known stars with $P < 450d$ removed

Remain 1437 (about 600 stars with known $P > 450d$)

Simbad classification and spectral types
(AGB, but also: YSO, PNe, B/Be/Bsg, QSO/galaxies)

Literature data (DENIS, IRSF, 2MASS, 2MASS6X + 'specialised' works) added to the VMC lightcurves

Work in progress



Black points indicate the VMC photometry. Coloured points are earlier epoch data from the literature. Periods are listed in the upper right corner or each plot.