PH556 Project Proposal
Team Stellar Rulers

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Project Overview

- Target Name: **V* V471 Vul**
- Variability Class: Classical Cepheid Variable
- Coordinates (J2000): $19^h34^m15^s.76 \ +19°34'14''.6$ (293.56567 $+19.57072$) [4]
- Magnitude Range of Target: $14.8 - 15.6$ (in B band) [4]
- Band of Observation: g
- Number of Images Required: 7
- Cadence (Time between two images): 1 Day
- Exposure time: 300s
- Total time of observation: 2100s

Goals

- Our goal is to calculate the period of magnitude oscillation of the target, which is a Classical Cepheid Variable [4].
- We will fit this period to a standard Period-Luminosity relationship curve [1] to obtain an empirical absolute magnitude of the target.
- Using the apparent magnitude and the calculated absolute magnitude we will then determine the approximate distance to the target.

Verification: We will verify our result both using Gaia DR3 [3] parallax measurements as well as previous distance calculations [2] done from the Period-Luminosity Relationship.

Visibility Plots

In the months of February the target is visible only for one hour before twilight, and for 2 hours near the end of March. We probably would not be able to take images on the days when the moon is up at this time ($\sim 1^{\text{st}}$ March - 14^{th} March).

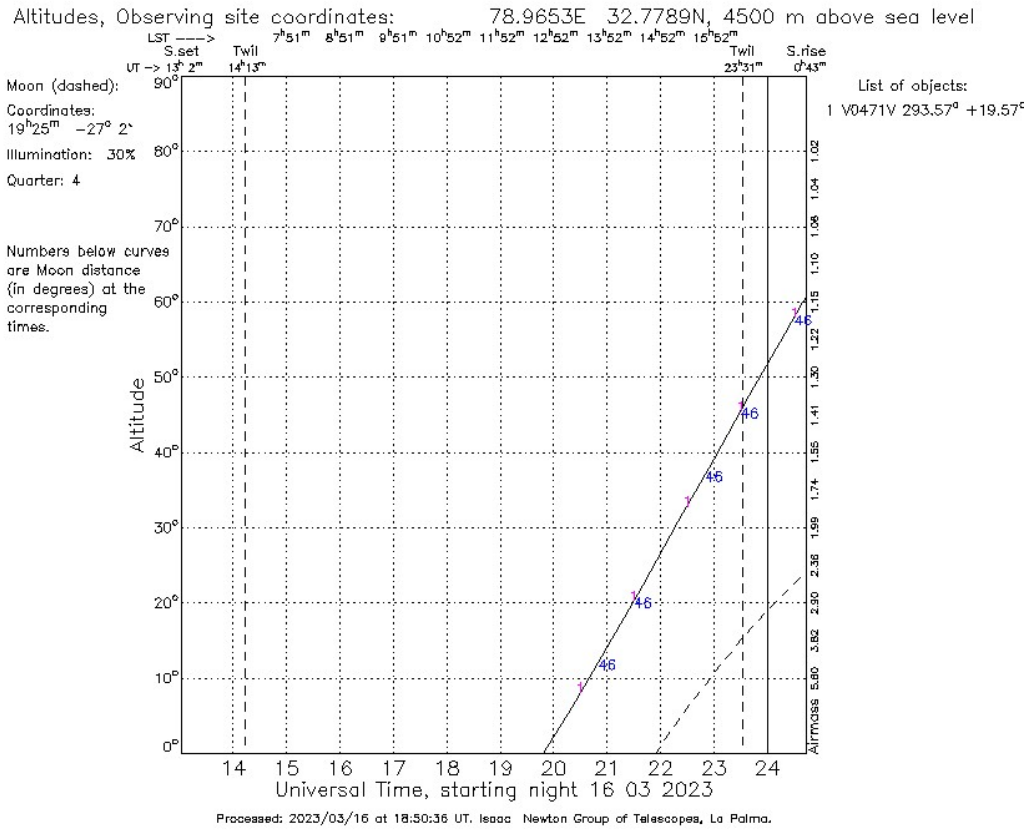

Figure 1: Visibility on 16 Mar 2023

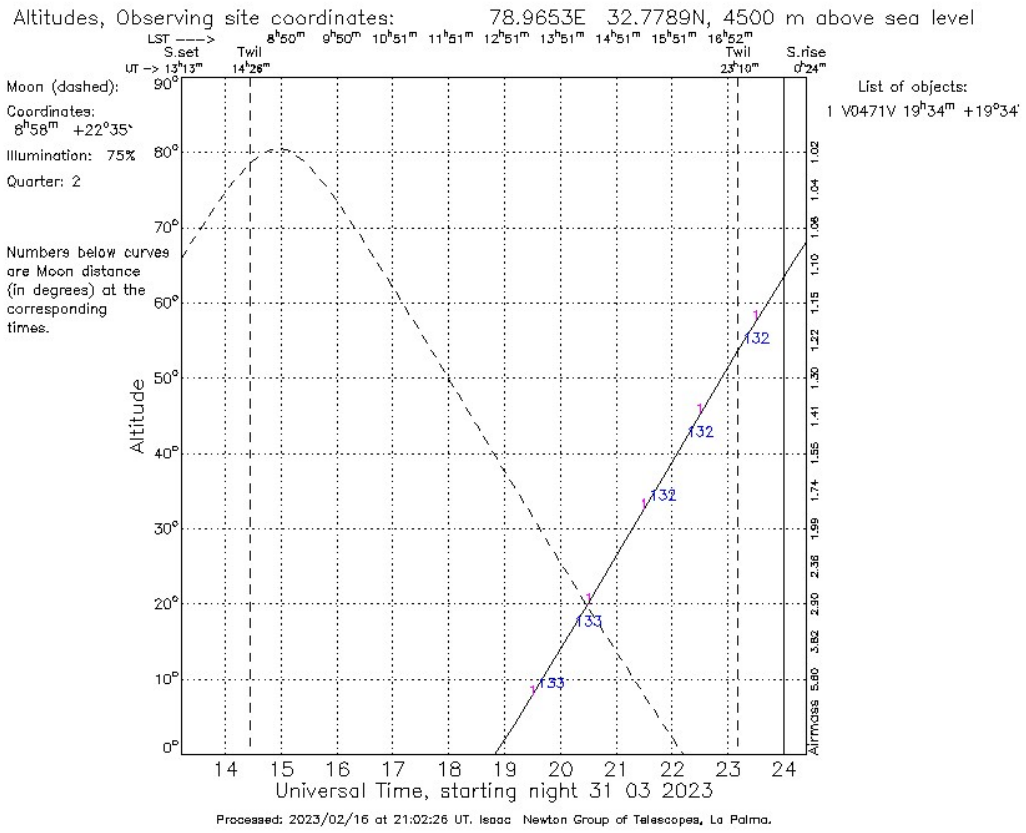

Figure 2: Visibility on 31 Mar 2023

References

[1] Breuval, Louise, Kervella, Pierre, Anderson, Richard I., Riess, Adam G., Arenou, Frédéric, Trahin, Boris, Mérand, Antoine, Gallenne, Alexandre, Gieren, Wolfgang, Storm, Jesper, Bono, Giuseppe, Pietrzy´nski, Grzegorz, Nardetto, Nicolas, Javanmardi, Behnam, and Hocdé, Vincent. The milky way cepheid leavitt law based on gaia dr2 parallaxes of companion stars and host open cluster populations. *A&A*, 643:A115, 2020.

[2] Université de Strasbourg/CNRS. Simbad. https://simbad.u-strasbg.fr/simbad/sim-id?Ident=%402772110&Name=V*+V471+Vul.

[3] Université de Strasbourg/CNRS. Vizier gaia dr3. https://vizier.cds.unistra.fr/viz-bin/VizieR-5?-ref=VIZ63ee97ab39561&-out.add=.&-source=I/358/vcep&recno=60&-out.orig=o.

[4] American Association of Variable Star Observers (AAVSO). Vsx. https://www.aavso.org/vsx/index.php?view=detail.top&oid=133744.