

# Confirming and Improving Ross Variable Star RV Del

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Sage, Kendra, and Jess on video call with astronomer Tyler Linder

## Abstract

RV Del is an intrinsic pulsating variable star in the constellation Delphinus, discovered by Ross (1926). The AAVSO list RV Del as a RRAB type variable star. RV Del has been found to have a magnitude that varies from V12.9-14.2 and a period of 11.9553 h.

The purpose of our research of RV Del is to confirm and improve previous results as well as explore different methods to engage middle school students in the scientific method and astronomy. The SKYNET network of telescopes allows students to request images from a group of international research class telescopes. The telescope request process provides students first-hand experience in astronomy while the data analysis allows students to understand advanced software systems to produce publishable results. Data is being gathered using the SKYNET network and Stone Edge Observatory to gather photometry of RV Del and create a new light curve.

Through the research process, we were not able to get the results we wanted. Due to multiple cloudy nights and difficulties finding a suitable software program, we were not able to get accurate results. We will however, continue with this project around June when RV Del is in the skies again, for as of now, the star is not visible.



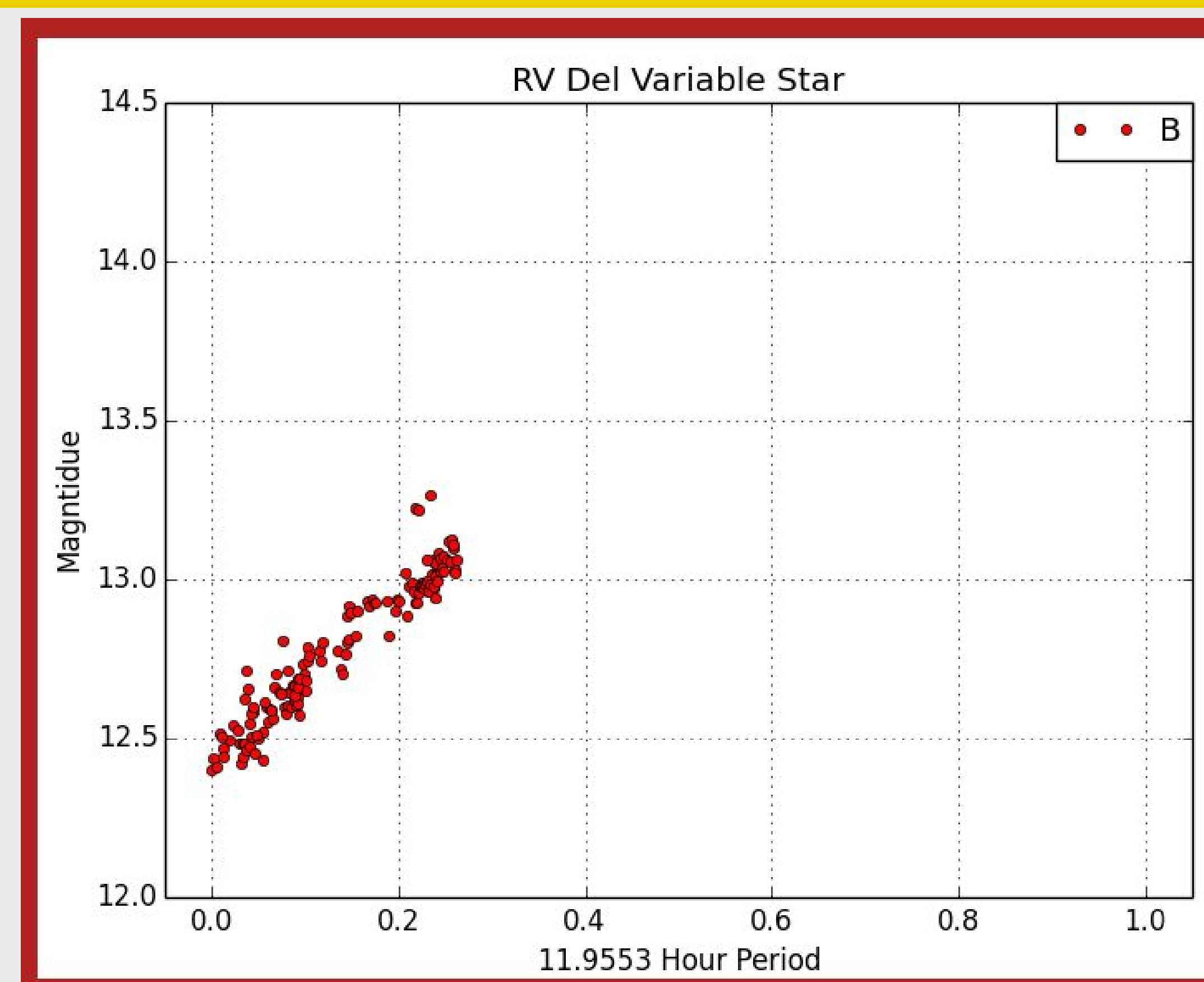
RV Del star field located at 20:20:41.47 15:15:15.0

## Problems and Improvements

Some difficulties we had were the images. We took images of RV Del, but in the majority of the images we ended up with cloud coverage that affected a major part of the data. We also tried to work with the software Canopus starting in the PhotoRed part of Canopus. We were continually running into errors while we were learning the software and ended up just turning to Canopus, but Canopus was not reliable for the data either. Canopus did not give accurate graphs.

We also had to cut out parts of the images we were using due to cloud coverage. That may have had effect on the outcome of the graphs. We do not think the graphs are accurate.

At the beginning of the project we had some trouble finding a mentor as well. We were not able to officially find a mentor until we came across Tyler Linder who offered to help, and ended up helping us tremendously in the end.



Part of the period of RV Del in the B filter

## Tips on Starting Your Own Program

When taking on a project like this there are a few things to consider: like what interests will be looked at for a project, what interest will influence the topic of the project, or what tools can be accessed. If a project will be started, a mentor, who has a background in the field that your topic will focus on, needs to be found. Access to a telescope will be needed in order to retrieve the data. You could do this through the SKYNET network. A computer will be needed to analyze and process the data that is received with the chosen software installed and ready to use. Most of all the project that is taking place must have plenty of interest so that it is fun. Choose something that isn't just work to be done.

## How Far We've Come

The chart above is the most accurate chart we were able to get from the data we had acquired. It includes a very small portion of the known period of RV Del. The data that was used to create this chart has been cleansed of the bad data due to cloud coverage and saturation. We will continue to add onto the chart next June.

## Future Research Plans

What we plan to do in the future on this project is continue to collect images in June, when RV Del is visible again. Our goal will remain the same to confirm RV Del's period of 11.9553 hours. The first step will be to find a more reliable software package that can be used to perform the analysis. We have to wait until June due to the fact that RV Del is currently not visible from the telescopes we will be using. We are excited to get started on this project again soon.



Sage, Jess, and Kendra working on photometry



At the plate vault in Yerkes Observatory with Wayne Osborn

