Light Curve Viewer

Table of contents

Preface

Light Curve Viewer (LCV) is ‘a test workbench for different light-curve-related procedures’.

Currently, implements some methods from:

Andronov, I. L., (Multi-) Frequency Variations of Stars. Some Methods and Results, Odessa Astronomical Publications, vol. 7, p. 49-54 (1994) [1994OAP.....7...49A]

Andronov, I. L., Advanced Time Series Analysis of Generally Irregularly Spaced Signals: Beyond the Oversimplified Methods, Knowledge Discovery in Big Data from Astronomy and Earth Observation, 1st Edition. Edited by Petr Skoda and Fathalrahman Adam. ISBN: 978-0-128-19154-5. Elsevier, 2020, p.191-224 [2020kdbd.book..191A]

System Requirements

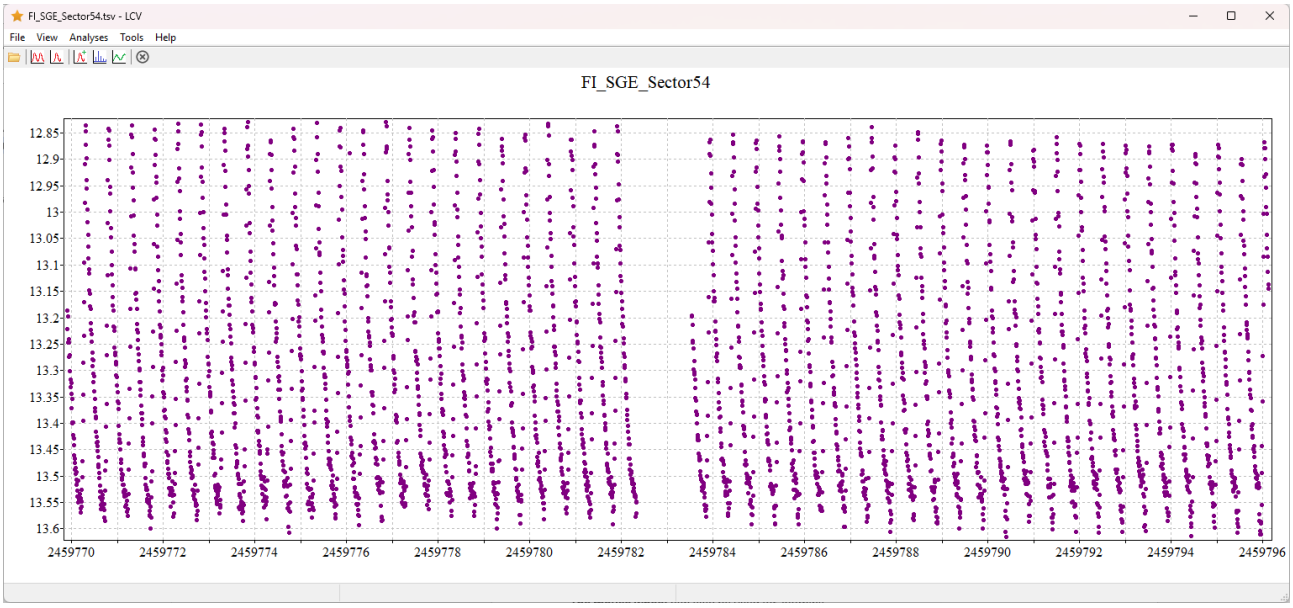
The program runs under Windows, tested under Windows 7, 10, 11.

Source files can be compiled under Linux (tested under Debian 12) using Lazarus/FreePascal (tested with Lazarus 3.8, Free Pascal 3.2.2)

Main program window

The main program window contains a chart showing loaded data. Use File->Open to load data from a text file (see 'Input file format').

After loading, the data is displayed as a 'scatter chart':



Manipulating chart

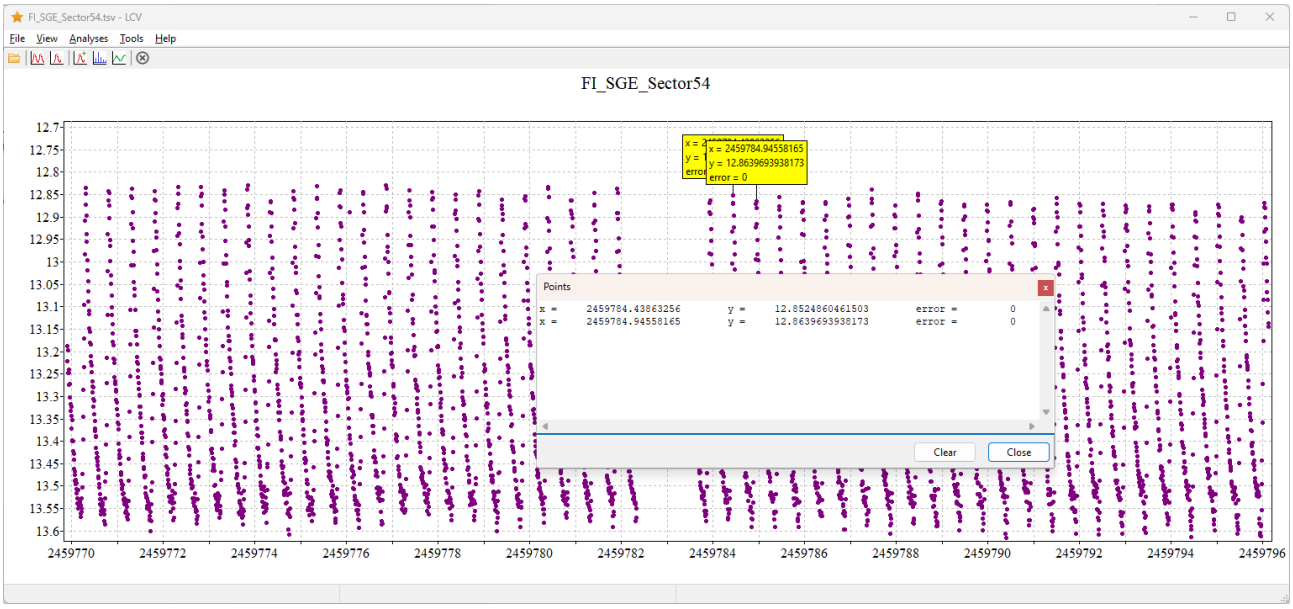
Ctrl + Left Mouse Button Dragging: select a part of the chart (zoom)

Shift + Left Mouse Button Dragging: shift the viewport (panning)

Ctrl + Left Mouse Button Clicking: restore the original view

Left Mouse Button Click on a point: add a label to the clicked point. To remove the label, click the point again.

Ctrl + Shift + Left Mouse Button Click: add a label to the clicked point and show the coordinates in a small window



The mouse wheel can also be used for zooming.

Clicking the right mouse button on the chart opens a pop-up menu with the following functions:

- copy the chart image to the Clipboard
- save the chart image to a PNG file
- set the chart extent

Main Menu

- File
  - Open... Open data file
  - Save a copy of Visible Data As... Save a copy of the data (currently visible -- after zoom) into a data file
  - Exit Close the program
- View
  - Raw Data Plot data as is
  - Phase Plot Plot the active phase plot or calculate a new one
  - Cycle-by-cycle color Plot each cycle in the phase plot in a different color
  - Show Data Display data (observations)
  - Show Errors Display error bars
  - Show Model Display the current approximation and its error corridor
  - Inverted Y Axis If checked, the Y axis is inverted
  - Chart Properties... Open the Chart Properties dialog
  - Chart Extent... Set the chart extent
  - Show Observations... Display data in a tabular form
- Analyses
  - Phase Plot Calculate a new phase plot
  - Periodogram... Open a dialog with the periodogram parameters
  - Polynomial Approximation... Open a dialog with the parameters of the polynomial (algebraic + trigonometric) approximation
  - Approximation Info... Display information about the current approximation
  - Detrend Subtract approximation from the data
- Tools
  - Options Tune the program settings
- Help
  - User Manual Online... Open the manual in the system web browser (from GitHub)
  - User Manual (Local)... Open the manual in the PDF viewer (from the local program's directory)

Periodogram

<under construction>

Polynomial approximation

<under construction>

Input file format

After installation, you can find example files in the **Documents\lcv_testdata** folder.

Text files with data must contain at least two columns, separated by spaces or tabs. If the columns are separated by tabs, each tab is considered one separator (spaces in this case are ignored). If the columns are separated by spaces, repeating spaces are considered one separator; leading spaces are ignored.

Lines starting with the '#' sign are ignored, as are empty lines.

The first column must contain X-values (i.e., dates) and the second – Y values (i.e., magnitudes or fluxes). The third column must contain Y-errors (uncertainties) if it is present. All other columns are ignored.