HUNTING FOR PLANETS WITH COROT

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Outline

- Raw light curves
- Noise sources
- Data Reduction
- Family portraits
- LC Analysis
- Interesting LC
- Transit-like LC
- Transits
- Conclusions

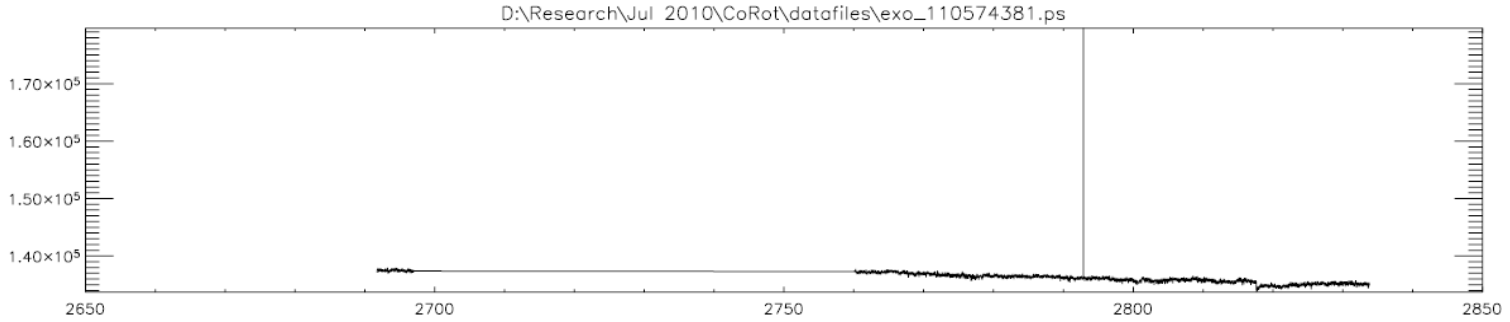
Raw light curves

- Two types of data : 32s, 16*32s = 512s
- Data types : Fits, Ascii
- Channels : White and the 3 color
- No. of light curves : 51
- Three first fields of CoRoT

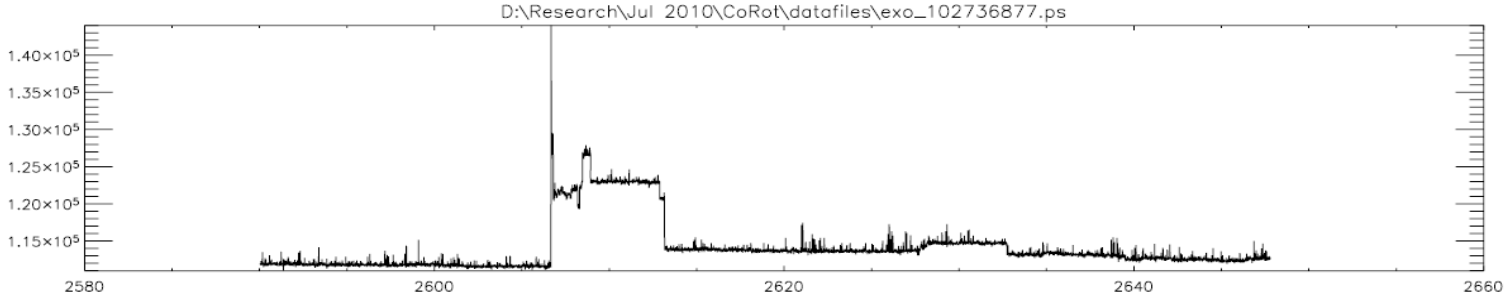
Noise sources

Inherent features prevent us from doing an effective fourier analysis

Eg 1 : Outliers

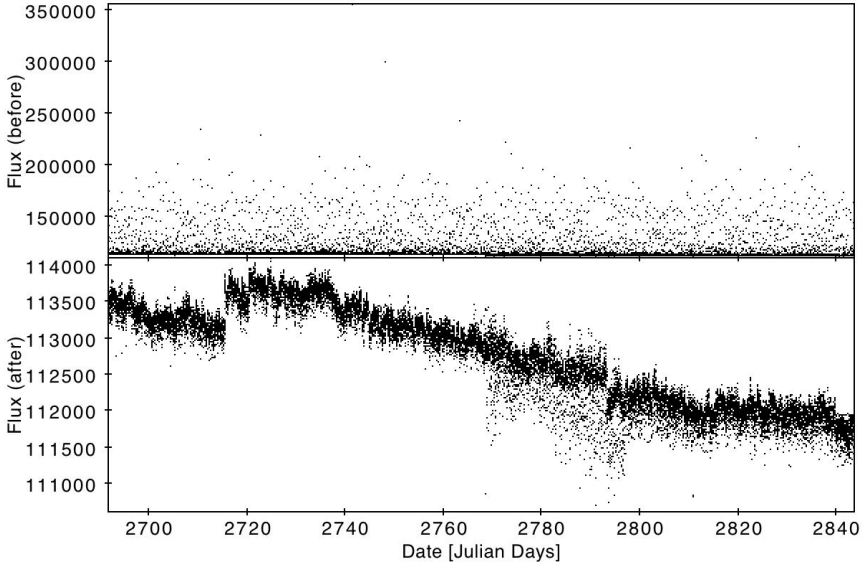


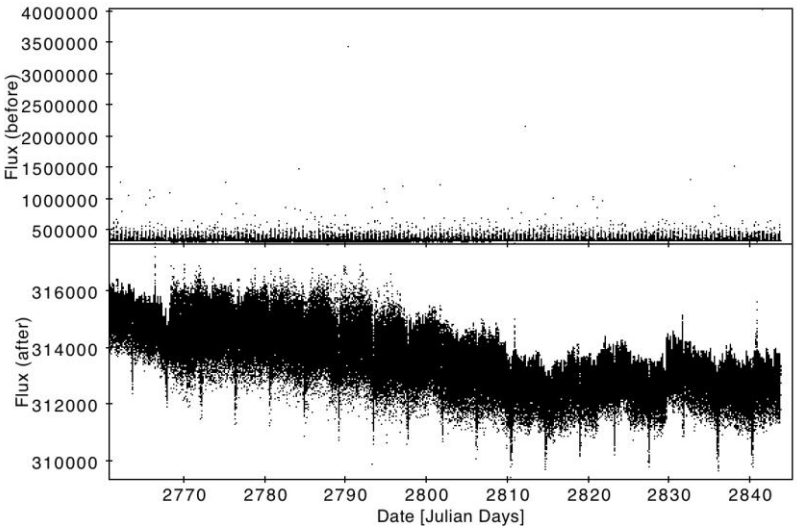
Eg. 2 : Jumps in data



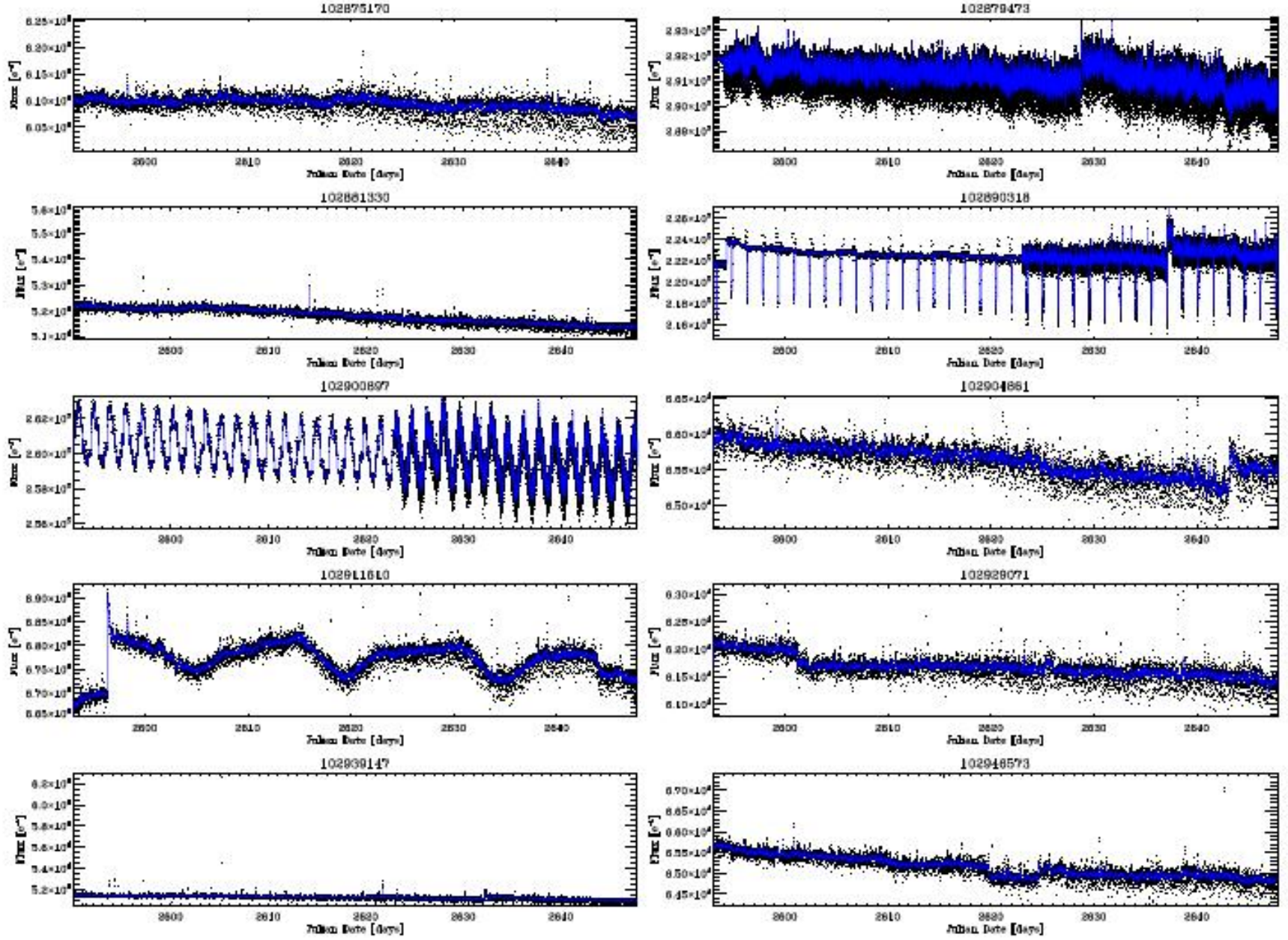
Data reduction

- Outlier removal : psuedo-Sigma clipping (iterative)
- No Median filter – seem to remove more points.
- Did not remove jumps – should be taken care in a more complex code.





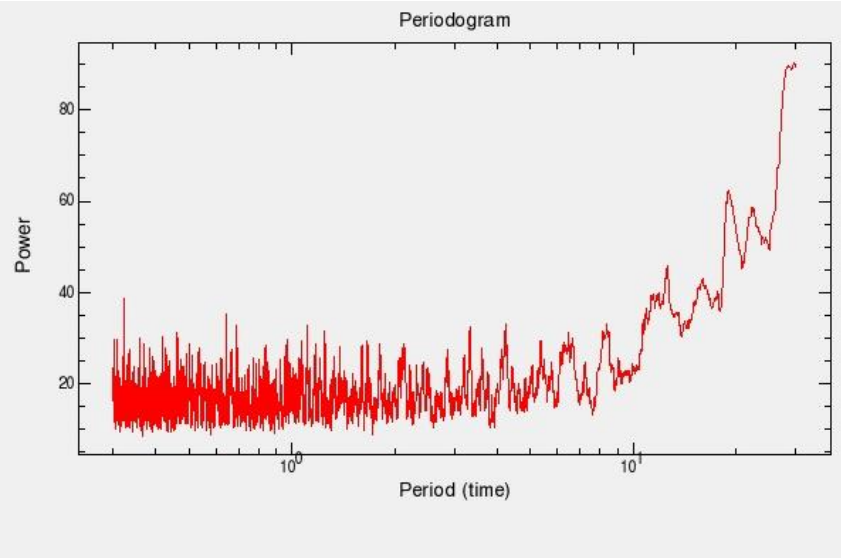
Family portrait



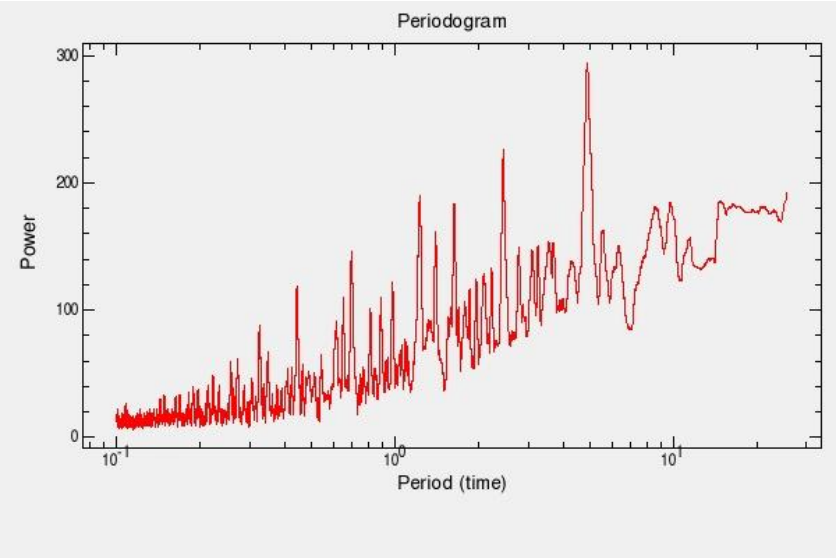
LC Analysis

- **NStED** Periodogram analysis
- **IDL**
- **TOPCAT**
- **Kaspar** transit parameter analysis tool

102777384

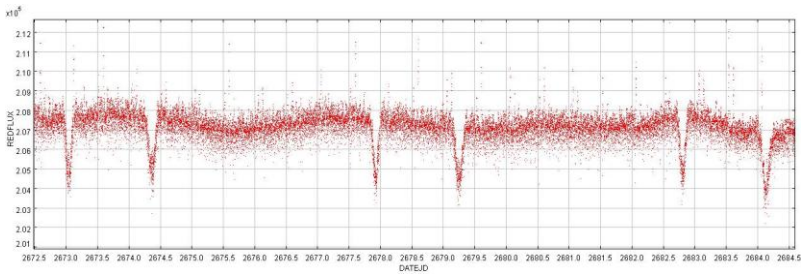


211674404

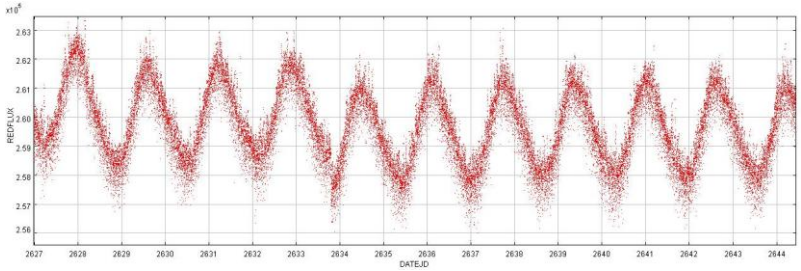


Interesting LC

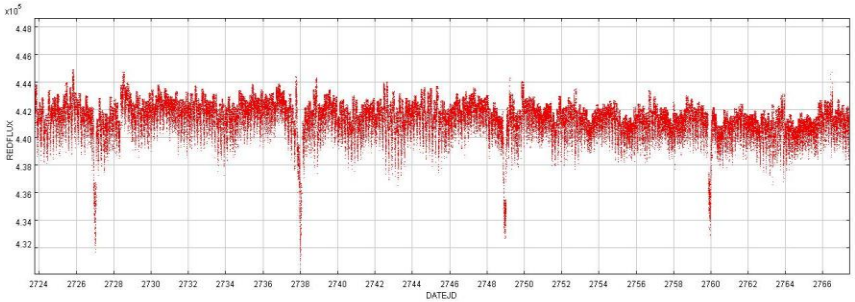
211674404



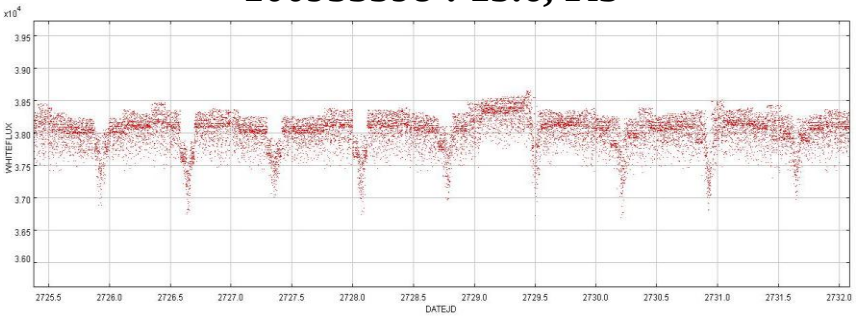
102900897 : 13.2, F1



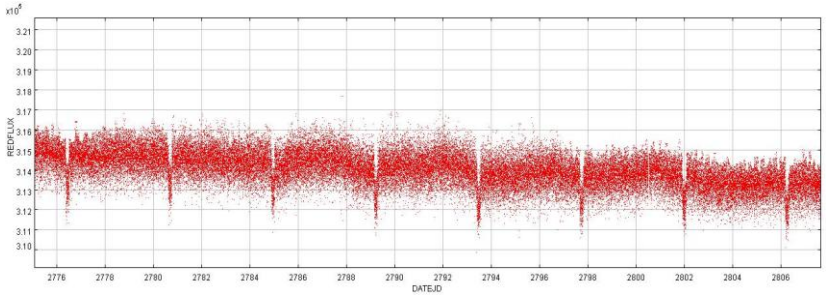
101351899 : 12.8, G2



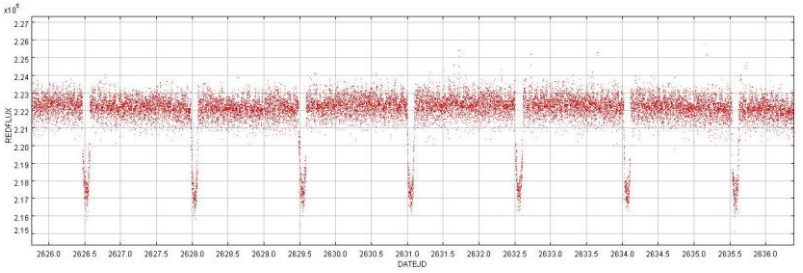
100953598 : 15.6, K5



101368192 : 13.1, G2

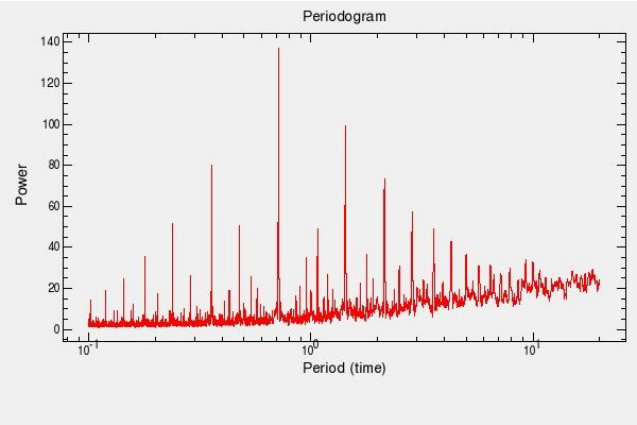


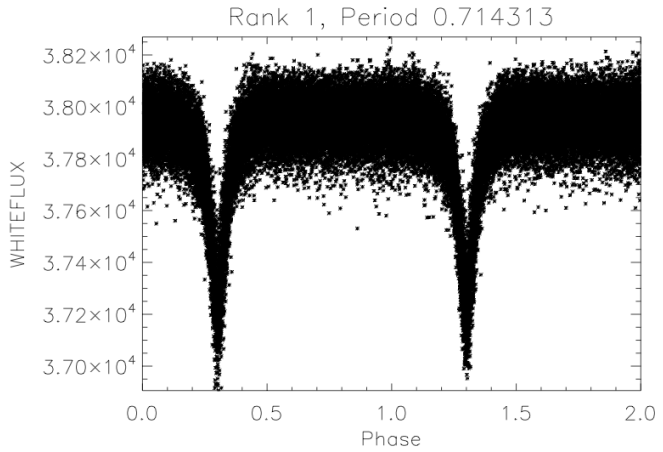
102890318 : 13.4, A0



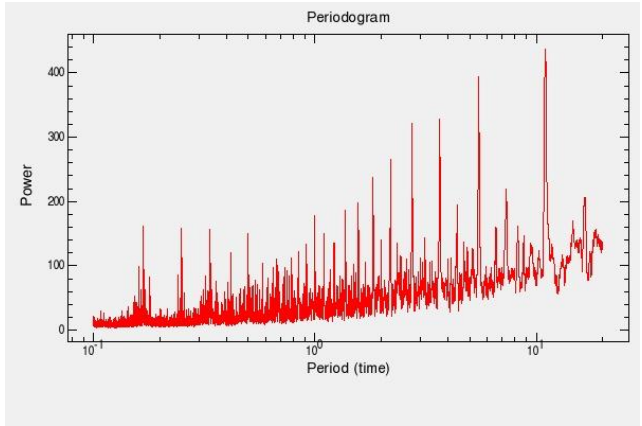
Transit-like events

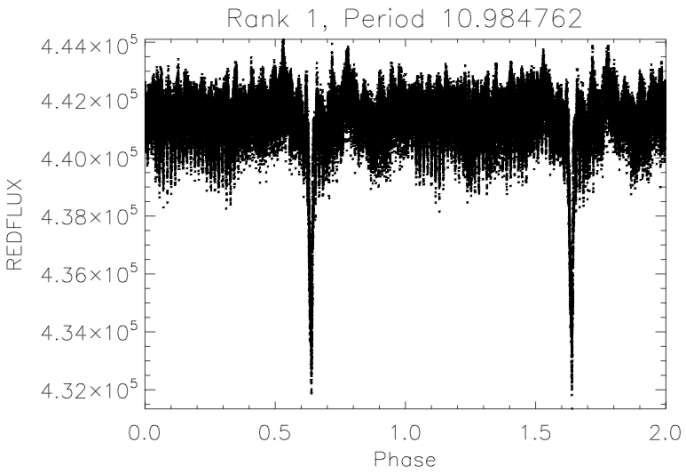
100953598





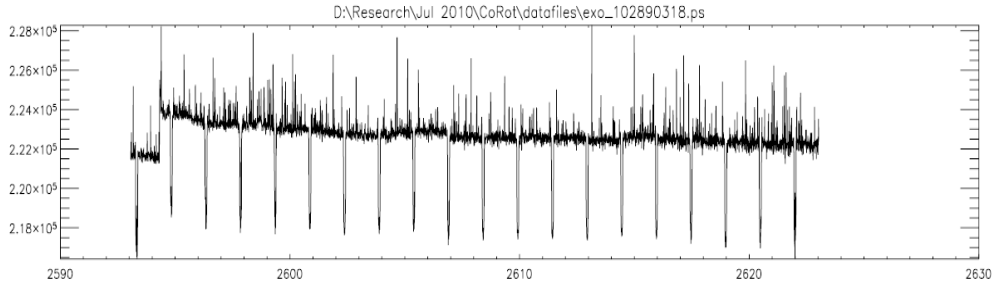
101351899



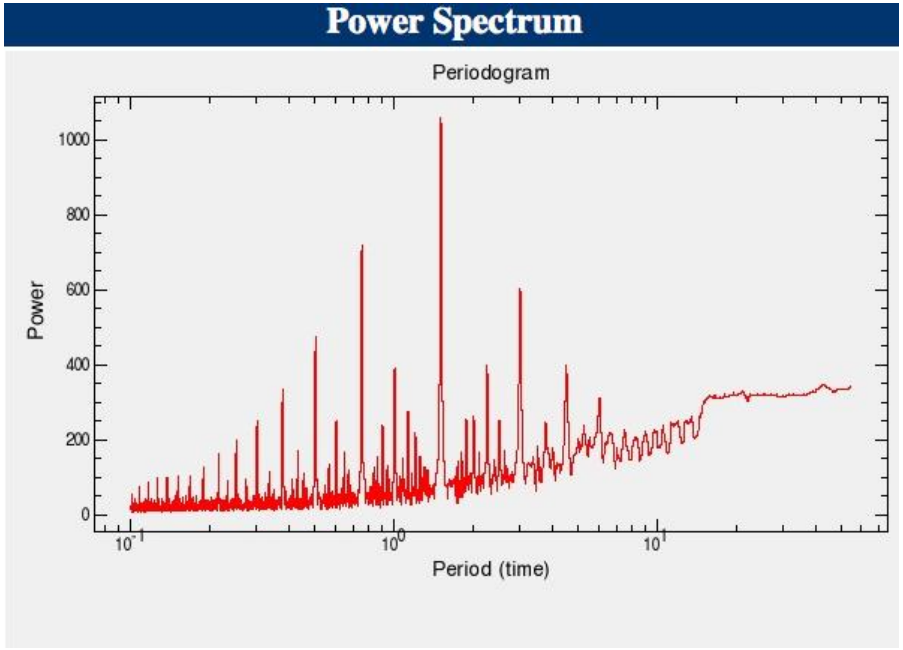


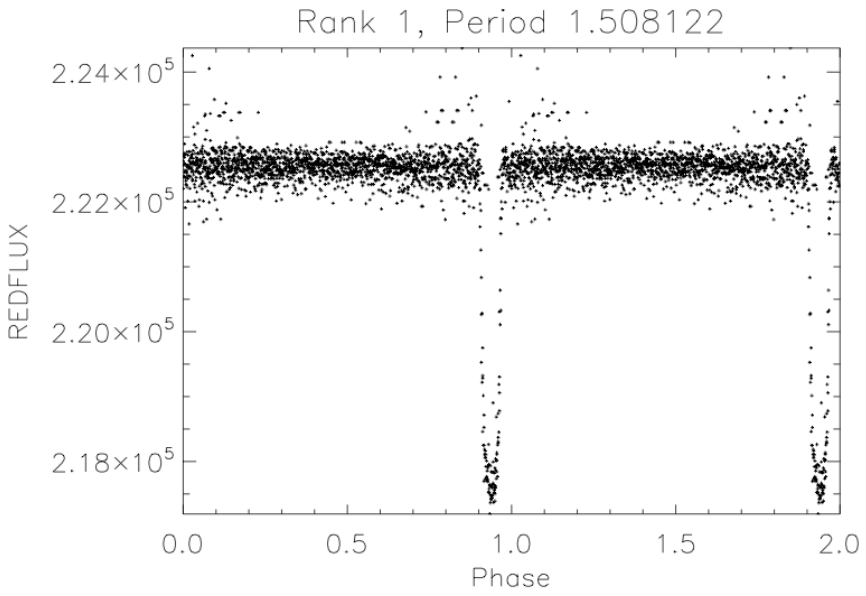
Transit events !!

102890318 – Corot 1b

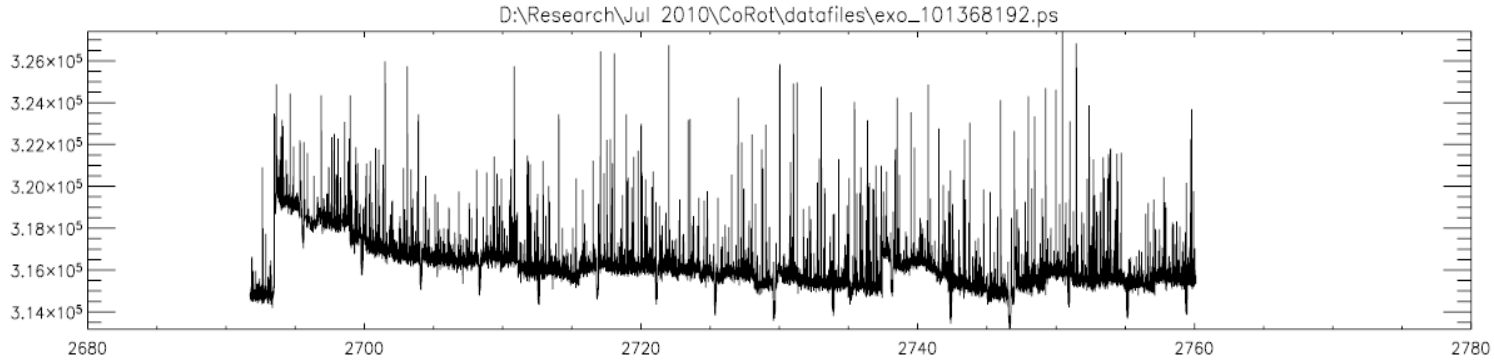


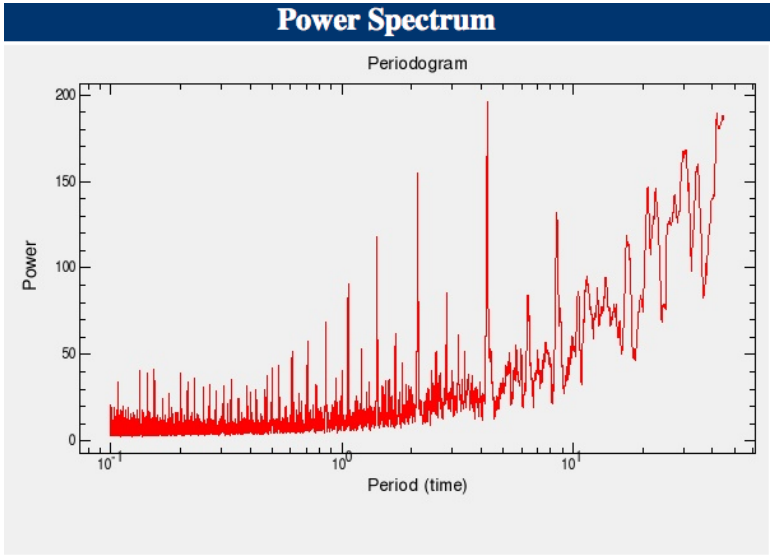
Result	1.50812d	1.5089d
a	0.0252AU	0.0254AU
R_planet	1.5649 R_{jup}	1.49 R_{jup}
i	82.72 deg	85.1 deg

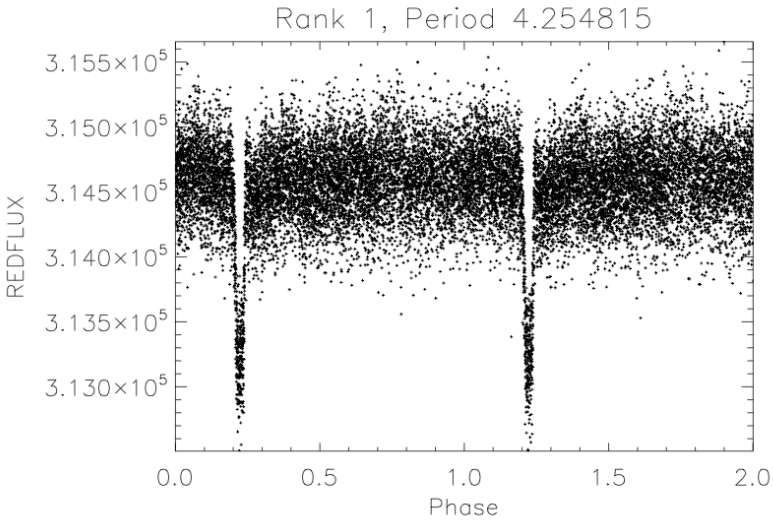




101368192 – Corot 3b







Conclusions

- Had to deal with data before going to analysis.
- Low frequency dominated periodogram.
- What we learned:

  - Various tools to reduce and analyze data.
  - Types of noise.
  - Learned what a transit looks like in a raw LC – doesn't look anything like a published one.

- Finally!!! We found 2 planets and many interesting objects