Search for exoasteroids orbiting WD 1145+017

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WD 1145 parameters

- Right ascension $11^{h}\ 48^{m}\ 33.63^{s}$
- Declination +01° 28′ 59.4″
- Distance 174 pc
- Mass $0.63 \pm 0.05 M_{\odot}$
- Radius $0.02\ R_{\odot}$
- Temperature 15,020 ± 520 K

Discovery of WD 1145+017 b

- Discovered with transit method based on data from K2 mission(Vanderburg, 2015)
- First known object orbiting the white dwarf
- Periods range from 4.5 hours to 4.9 hours
- Evolution of light curve

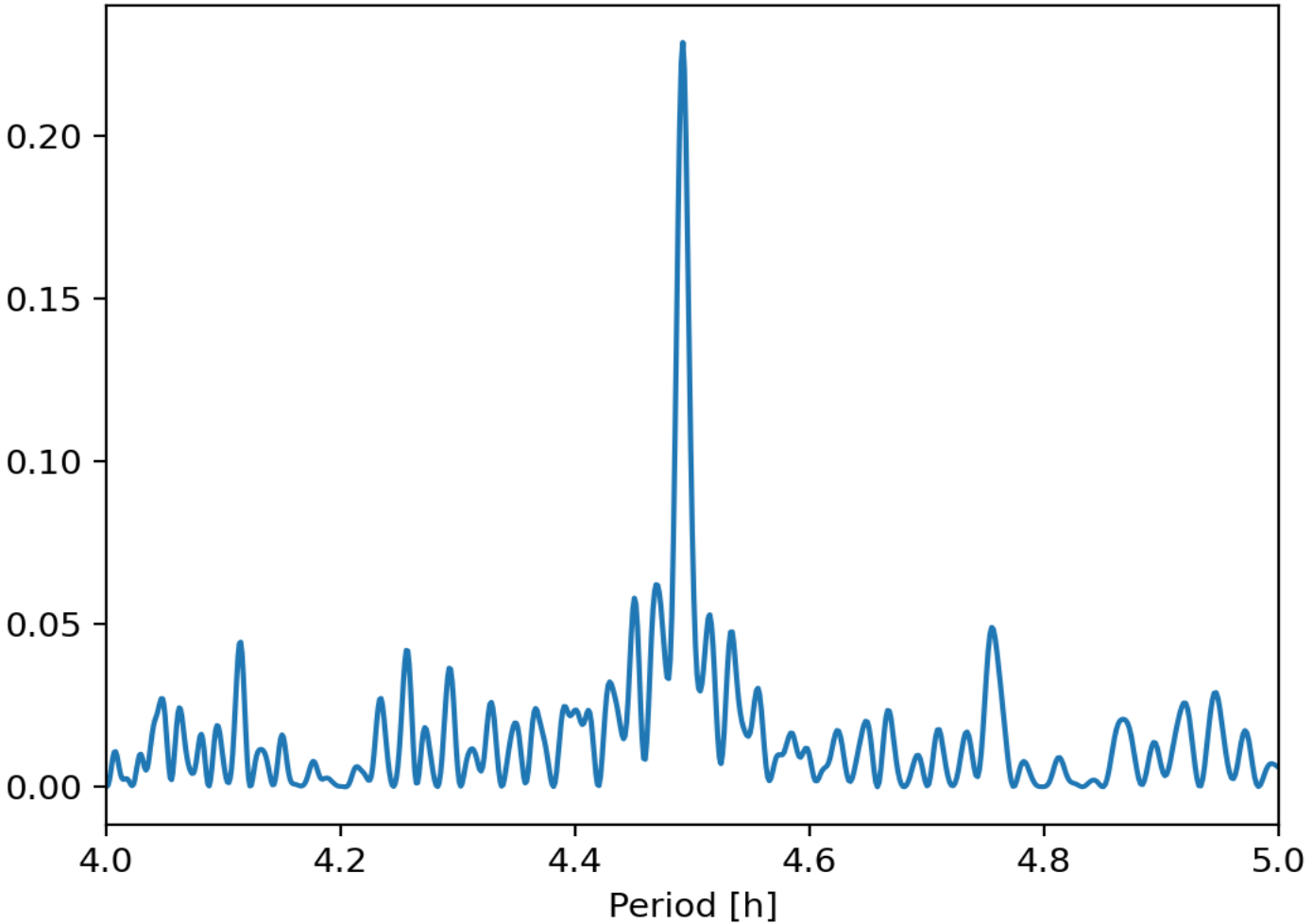
Observations of WD 1145

Observers: J. Budaj ,D. Mkrtichian, Z. Garai, S. Zharikov, T. Pribulla, R. Komzik, A. Kusakin, Shestakova, R. Kokumbeva, I.Reva, S. Joshi, A. Valeev, D. Gadelshin, G. Valyavin, N. Athano, R. Mennickent, I. Sucha, B. Gary

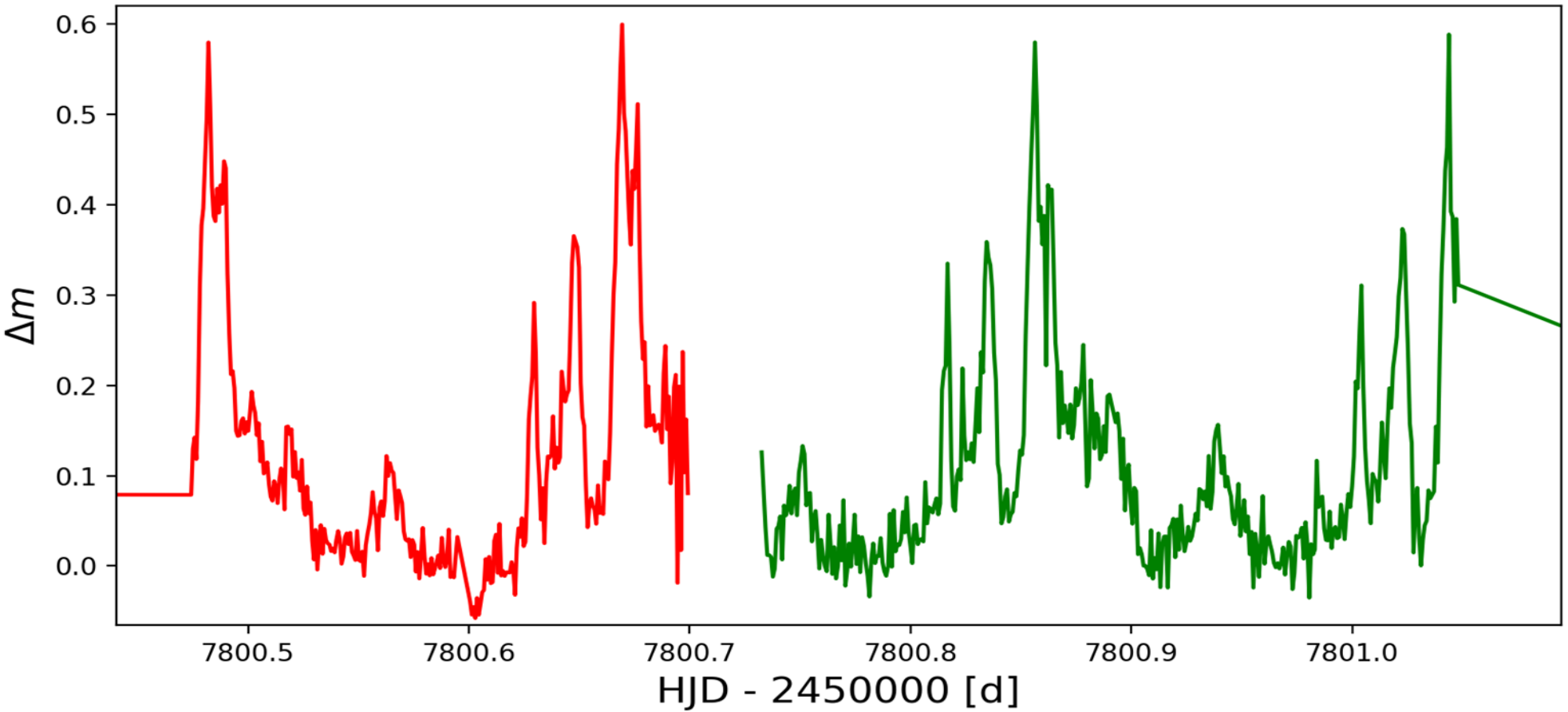
Telescopes:

- 3.6m telescope, Devastal, India
- 1.5m RATIR, Mexico
- 1.3m Skalnate Pleso, Slovakia
- 1m Nizhnij Arkhyz, Russia
- 1m TSAO, Kazakstan
- 0.7 m Gaomeigu China
- 0.6m PROMPT-8, Cerro Tololo Inter-American Observatory
- 0.6m Stara Lesna, Slovakia
- 0.5 TNO, Narit, Thailand
- 0.4m Australia,
- 0.4m Tenerife, Spain

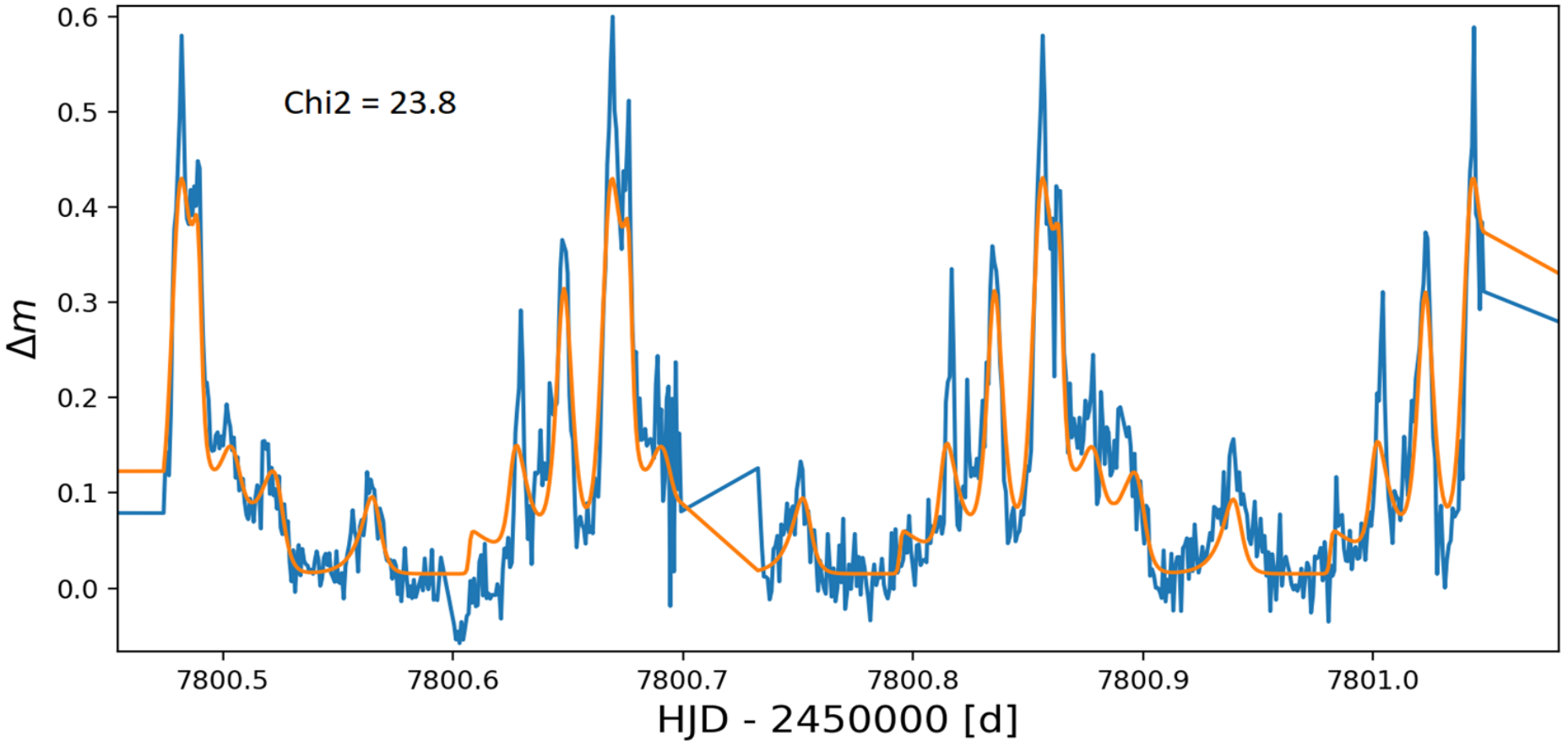
WD 1145+017 periodogram



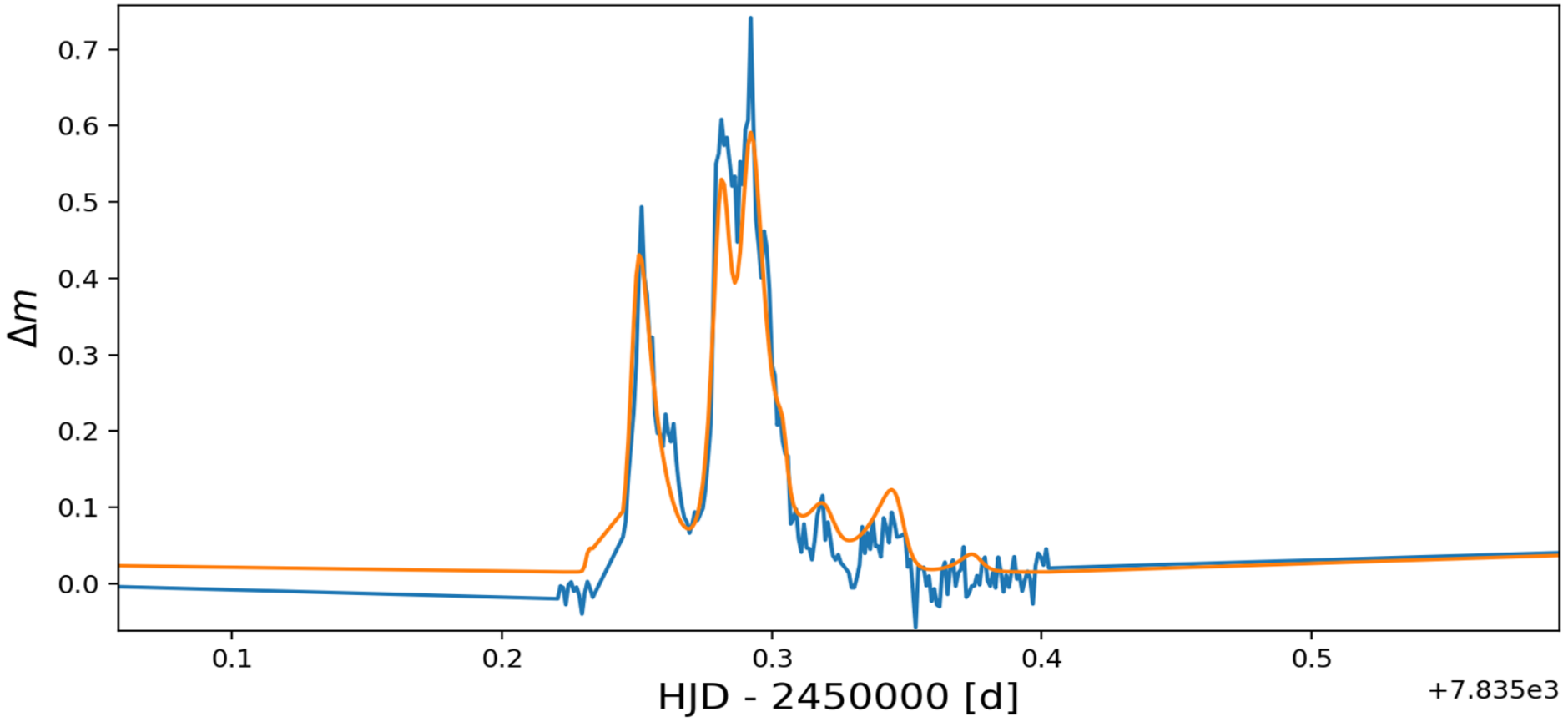
WD 1145 lightcurve(2016)

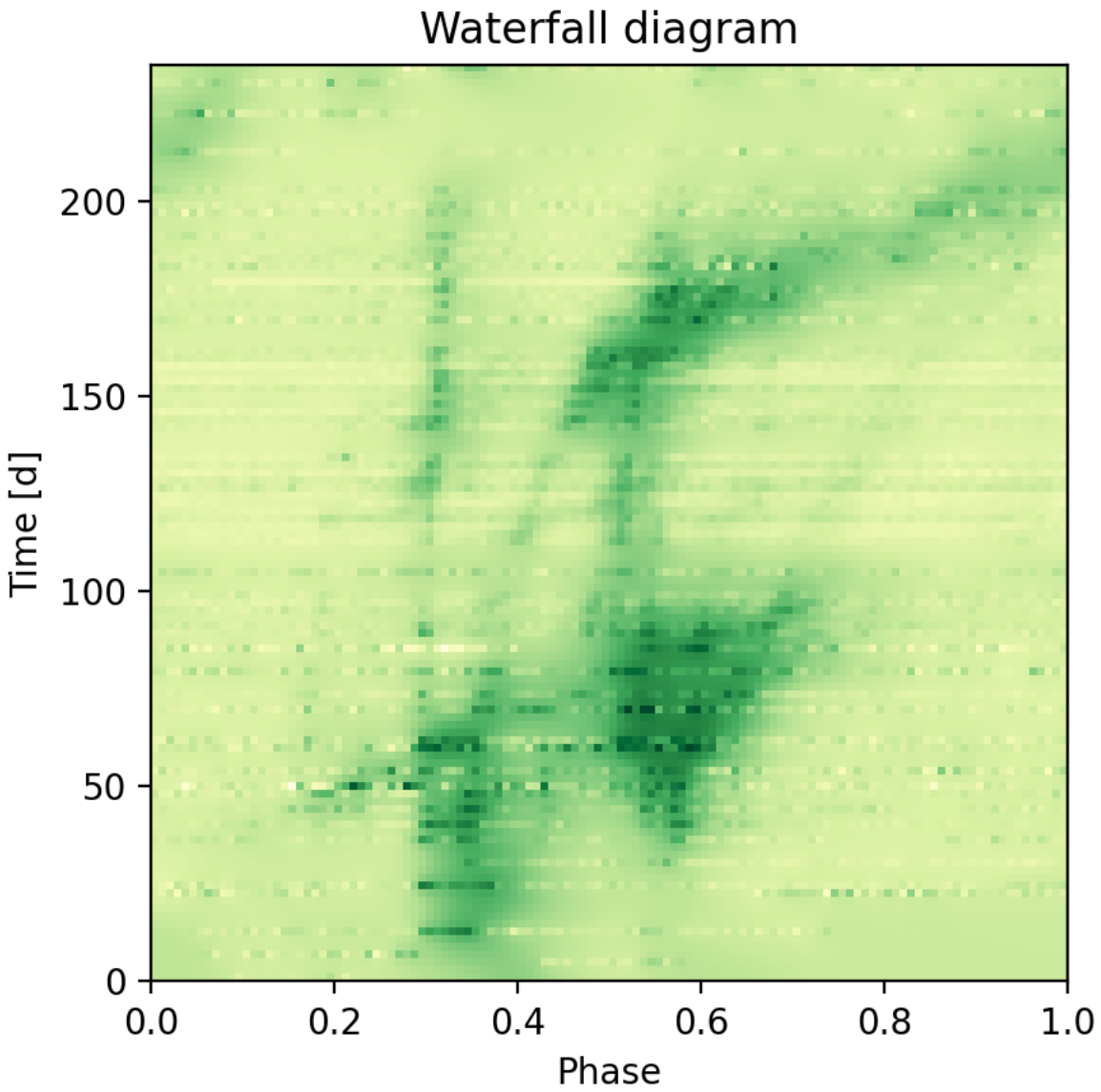


WD 1145 lightcurve(2016)



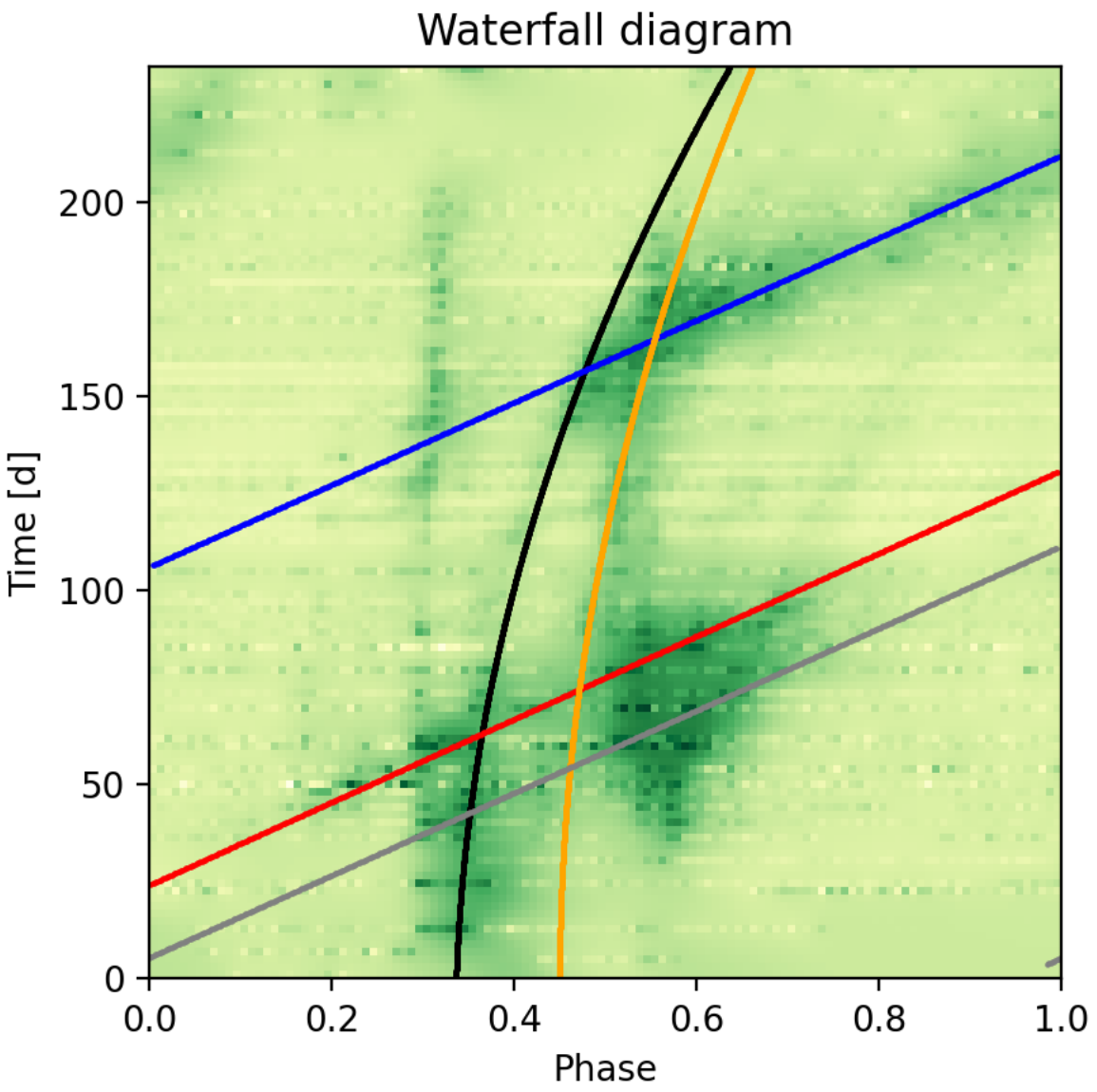
Evolution with time





- Assumption:

$$P = P_0 \exp(t/\beta)$$


Waterfall diagram
Time [d]
0
50
100
150
200
0.0
0.2
0.4
0.6
0.8
1.0
Phase

Conclusions

1. We identified 8 exoasteroids orbiting WD 1145
2. We have estimated orbital periods of exoasteroids, which vary from 4.4915 to 4.4932.
3. Waterfall diagram shows that period evolves with time. Shape of traces on the diagram is defined by difference between real period of body and reference value of period and parameter β which are degenerated.