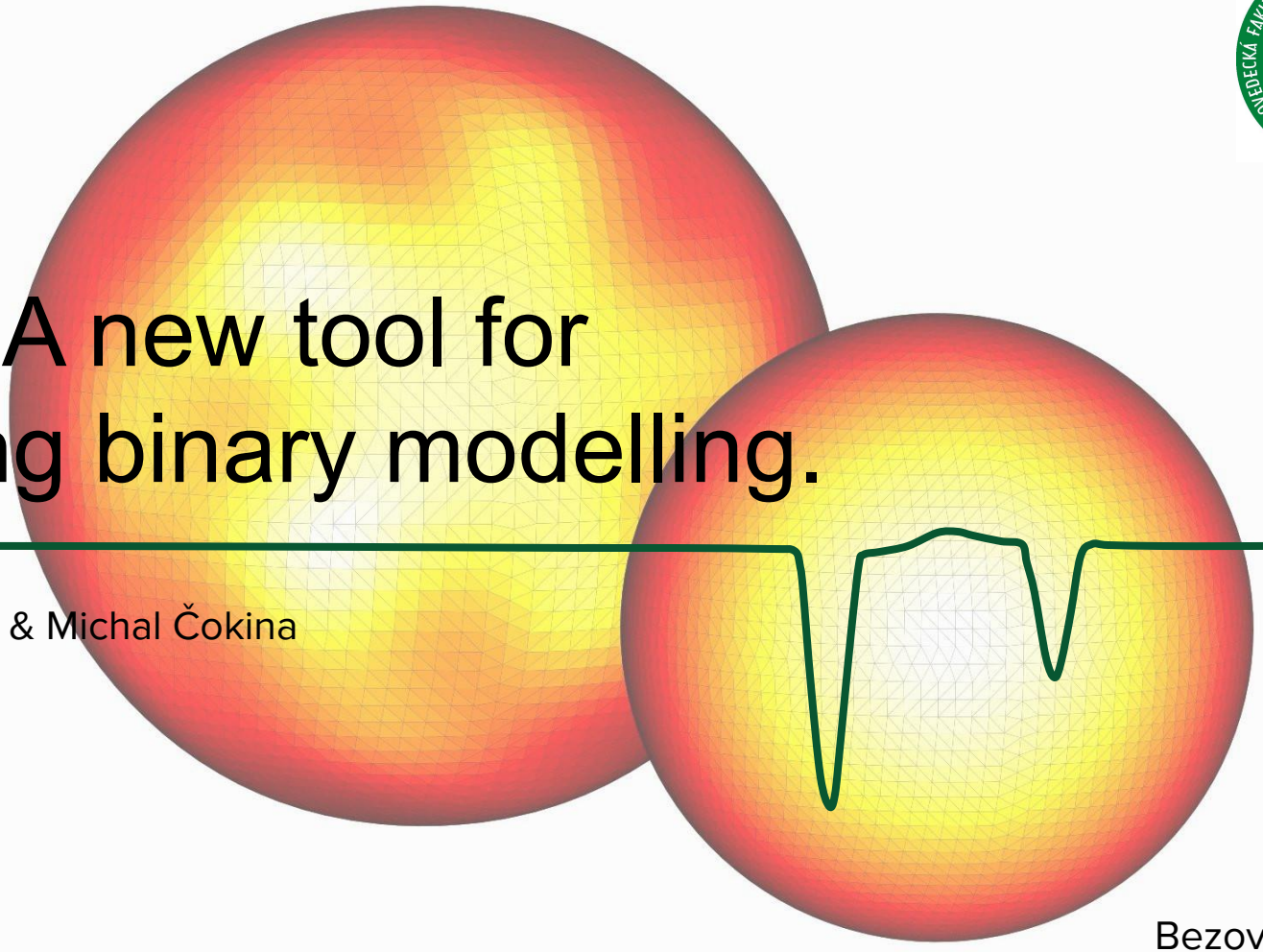
Pavol Jozef Šafárik University in Košice

ELISa: A new tool for eclipsing binary modelling.

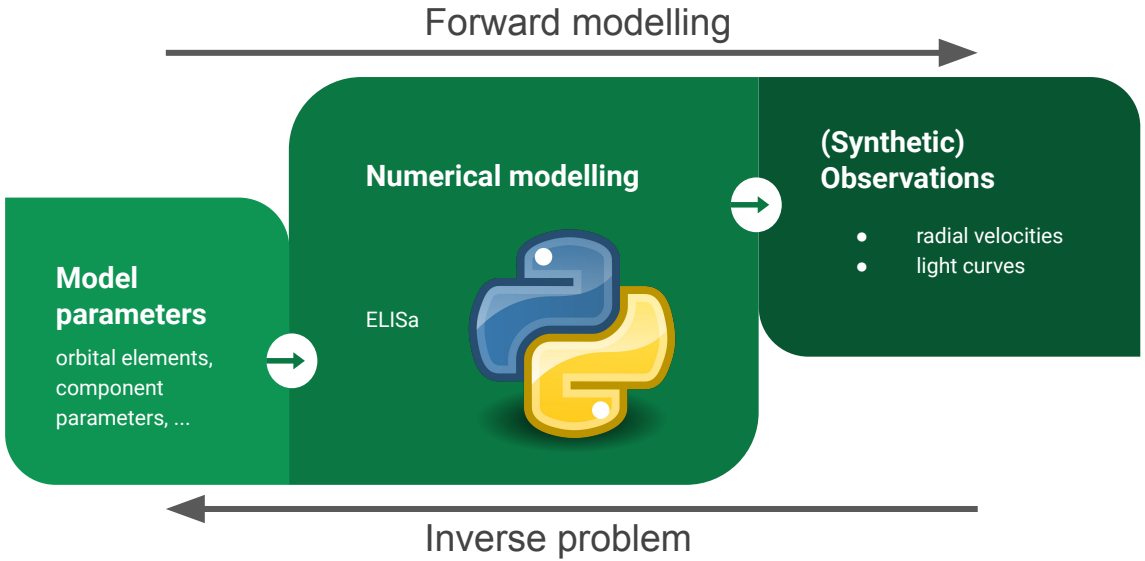


Miroslav Fedurco & Michal Čokina

Bezovec 2021

ELISa: data analysis tool

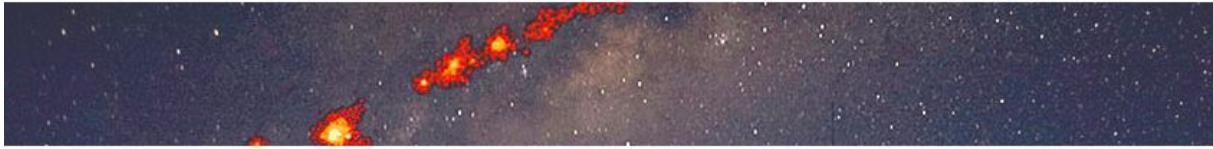
- Binary systems
- Single stars
- Surface features:
  - Spots
  - Non-radial pulsations
- Observer: producing observations
- Inverse problem:
  - LS
  - MCMC



New paper:

Astronomy & Astrophysics

All volumes For authors



Free Access

Issue	A&A Volume 652, August 2021
Article Number	A156
Number of page(s)	14
Section	Numerical methods and codes
DOI	https://doi.org/10.1051/0004-6361/202039171
Published online	27 August 2021

A&A 652, A156 (2021)

ELISa: A new tool for fast modelling of eclipsing binaries

Michal Čokina, Miroslav Fedurco and Štefan Parimucha

Received: 12 August 2020 **Accepted:** 22 May 2021

Abstract

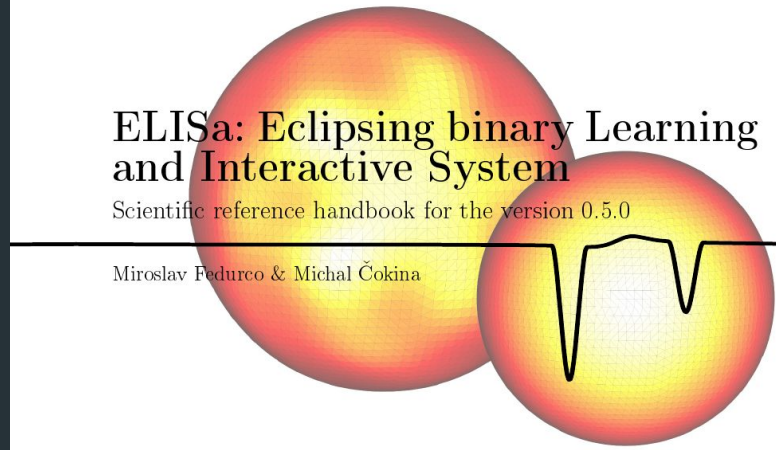
Context. We present a new, fast, and easy to use tool for modelling light and radial velocity curves of close eclipsing binaries with built-in methods for solving an inverse problem.

Aims. The main goal of ELISa (Eclipsing binary Learning and Interactive System) is to provide an

New handbook available!

- detailed structure of the package,
- description of the physics and novel numerical optimisation methods used in ELISa

Pavol Jozef Šafárik University in Košice,
Faculty of Science
Department of Theoretical Physics and Astrophysics



ELISa: Eclipsing binary Learning and Interactive System

Scientific reference handbook for the version 0.5.0

Miroslav Fedurco & Michal Čokina

Košice 2021

version.py	CHANGELOG.rst cleanup	11 months ago

README.rst

build passing | version 0.5.dev0 | license GNU/GPLv2 | python 3.6|3.7|3.8 | os Linux|Windows

Eclipsing binaries Learning & Interactive System

Important note: the version of the ELISa package consistent with our upcoming paper in A&A is available in our development branch that can be installed using pip:

```
pip install git+https://github.com/mikecokina/elisa.git@dev
```

See the instruction below to see a full installation process. The stable version 0.5 will be available soon.

ELISa

ELISa is a cross-platform python package dedicated to light curves modelling of close eclipsing binaries including surface features such as spots (and pulsations which will be added soon). Current capabilities include:

- `BinarySystem:` class for modelling surfaces of detached, semi-detached and over-contact binaries
- `SingleSystem:` class for modelling surfaces of single star light curves with full implementation of spots and pulsations
- `Observer:` class for generating light curves (and in future other observab
- class for generating stellar spot with given longit

mirofedurco Miro Fedurco

mikecokina Mike

Environments 1

github-pages Active

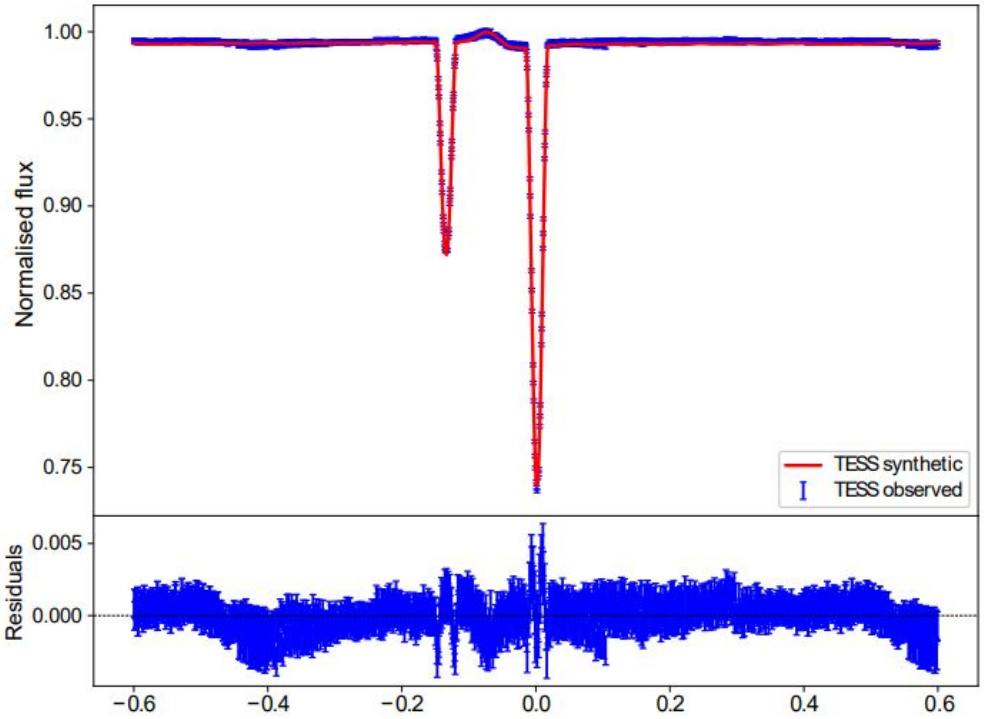
Languages

Python 100.0%

GitHub: https://github.com/mikecokina/elisa

V680 Mon

- high eccentricity system,
- fitting process: days instead of weeks,
- prior standard distribution of primary T_{eff} according to spectroscopy: 12500 ± 400 K,
- error propagation to relative radii,
- initial constraining to synchronous rotation at periastron:



Paunzen et al., 2021