

Improving the visibility and citability of exoplanet research software

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Exoplanet Modeling and Analysis Center

emac.gsfc.nasa.gov



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Welcome to the GSFC Exoplanet Modeling and Analysis Center (EMAC)

EMAC serves as a catalog, repository and integration platform for modeling and analysis resources focused on the study of exoplanet characteristics and environments. EMAC is a key project of the GSFC [Sellers Exoplanet Environments Collaboration](#) (SEEC).

If you've used EMAC in any part of your research, please cite our [RNAAS paper](#) either in your methods section or in the "Software used" portion of any manuscripts; see the [FAQ](#) for more information.

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ExoFOP: The Exoplanet Follow-up Observing Program

NASA Exoplanet Archive team at NExScI/IPAC [Pop](#)

This website is designed to optimize resources and facilitate collaboration in follow-up studies of exoplanet candidates. ExoFOP serves as a repository for project and community-gathered data by allowing upload and display of data and derived astrophysical parameters.

Last updated: Oct. 26, 2023

EMAC 2310-007





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Code Language(s): N/A

blase: An Interpretable Machine Learning Framework for Modeling High-Resolution Spectroscopic Data

Michael Gully-Santiago & Caroline V. Morley

[Fit](#)[Obs](#)[Star](#)

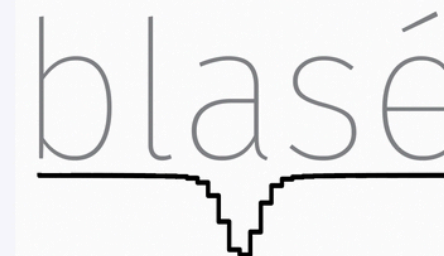
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Blasé introduces a powerful new approach to whole-spectrum fitting: clone 10,000+ spectral lines from a precomputed synthetic spectral model template, and then learn the perturbations to those lines through comparison to real data. Each spectral line has 4 parameters, yielding possibly 40,000+ parameters. The technique hinges on the magic of autodiff, the enabling technology behind Machine Learning, to tune all of those parameters precisely and quickly. The tool has conceivable extensions to Doppler imaging, Precision RV's, abundances, and more. It is built in PyTorch, with native GPU support.

Last updated: Oct. 10, 2022

Code Language(s): Python, PyTorch

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“Hey, ADS, could we
be indexed by you?”

“Hi, EMAC! Sounds interesting;
let’s talk about this!”



astrophysics
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**2023 ADASS
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blase: An Interpretable Machine Learning Framework for Modeling High-Resolution Spectroscopic Data

EMAC 2210-001



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Fit

Obs

Star

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An Interpretable Machine-learning Framework for Modeling High-resolution Spectroscopic Data

Show affiliations

Gully-Santiago, Michael ; Morley, Caroline V.

Comparison of échelle spectra to synthetic models has become a computational statistics challenge, with over 10,000 individual spectral lines affecting a typical cool star échelle spectrum. Telluric artifacts, imperfect line lists, inexact continuum placement, and inflexible models frustrate the scientific promise of these information-rich data sets. Here we debut an interpretable machine-learning framework blasé that addresses

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arXiv



DATA PRODUCTS

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EMAC (1)



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GRAPHICS



Astrophysics Source Code Library (ASCL)

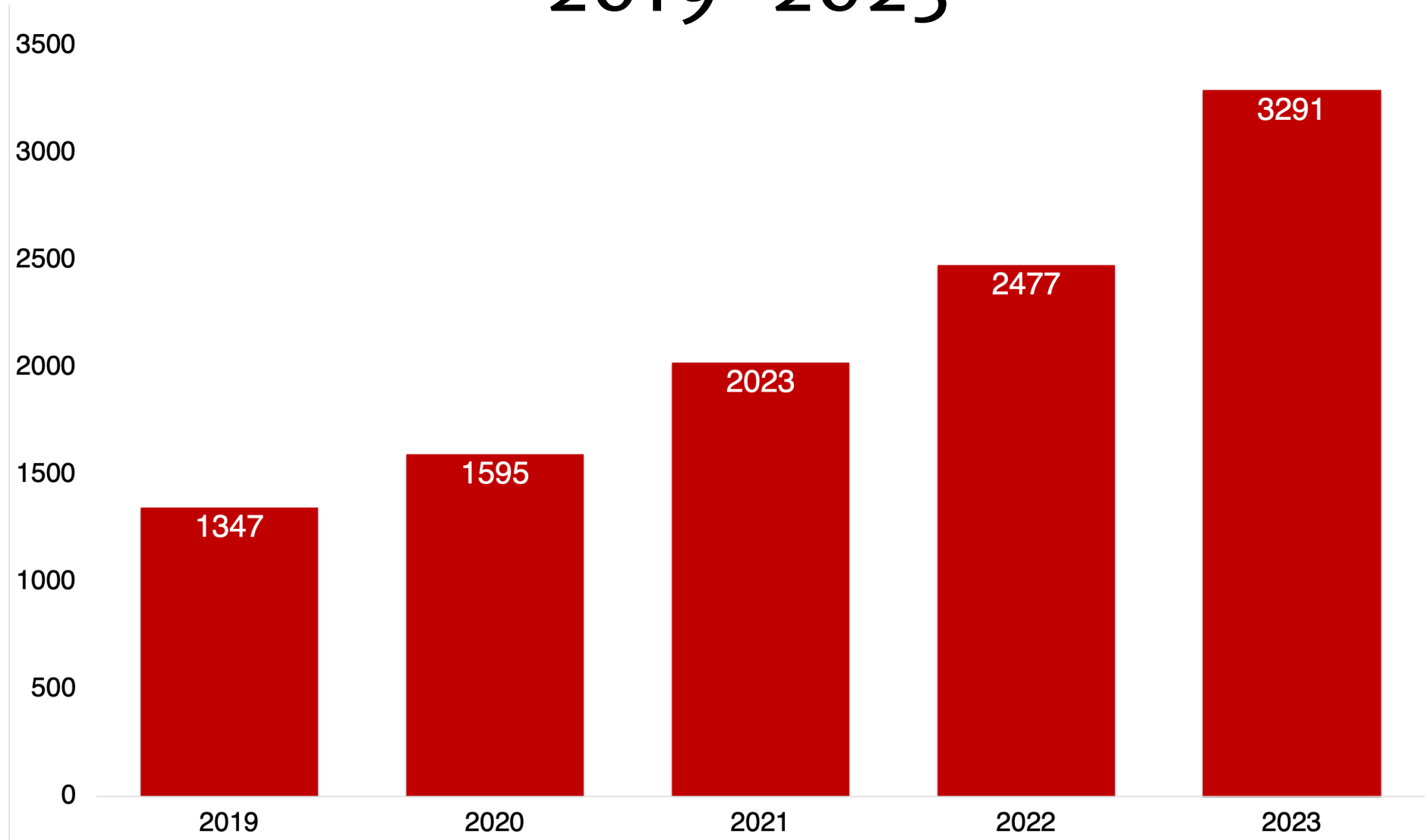
Registry of codes used in research; also accepts code deposits

Assigns unique ID (ascl ID)

Indexed by ADS and Web of Science

`ascl.net`

Citations to ASCL entries per year 2019-2023



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“Hey, ASCL, could you register downloadable software in EMAC that isn’t already in the ASCL?”

“Hi, ADS and EMAC! Sure, so long as the software meets our criteria!”

ASCL.net
Astrophysics Source Code Library



Monthly seminar on astronomy software

3rd Wednesday of each month at 11 am East coast time (US) via Zoom

Usually two 20 minute talks followed by discussion

Seminars are recorded and put on YouTube

<https://vast-seminars.github.io/>



“Hey VAST, could we create a spin-off just for EMAC astro software?”

“Sure!”



*exo***VAST** Exoplanet Virtual Astronomy Software Talks

1st Wednesday of each month, 11 am ET (US) via Zoom

Started this month!

Usually two 20 minute talks followed by discussion

Seminars are recorded and put on YouTube

`vast-seminars.github.io/exovast.html`



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*exo*VAST seminars!

Thank you!