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ATM: An Open-Source Tool for Asteroid Thermal Modeling

Joachim Moeyens[a,1,*], Nathan Myhrvold[b,2], Željko Ivezić[a,3]

[a] *University of Washington, 3910 15th Avenue NE, Seattle, WA 98195, USA*
[b] *Intellectual Ventures, Bellevue, WA 98005, USA*

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We will describe ATM, an open-source Python package designed to model asteroid flux measurements to estimate an asteroid's size, surface temperature distribution, and emissivity. A number of the most popular static asteroid thermal models (NEATM, STM, FRM) are implemented with the reflected solar light contribution and Kirchhoff's law accounted for. Priors for fitted parameters can be easily specified and the solution, including the full multi-dimensional posterior probability density function, is found using Markov Chain Monte Carlo (MCMC). We will also summarize recent results from [1], where ATM was used in analysis of NEOWISE data, including a discussion of how candidate metallic asteroids can be selected using the best-fit ATM temperature parameter and infrared albedo.

References

[1] J. Moeyens, N. Myhrvold, Ž. Ivezić, ATM: An open-source tool for asteroid thermal modeling and its application to NEOWISE data, Icarus 341 (2020) 113575.

*Corresponding author
Email addresses: moeyensj@uw.edu (Joachim Moeyens), nathanm@intven.com (Nathan Myhrvold), ivezic@uw.edu (Željko Ivezić)
[1] Ph.D. student, Department of Computer Science
[2] Senior Researcher
[3] Professor, Department of Astronomy