



ATM: AN OPEN-SOURCE TOOL FOR ASTEROID THERMAL MODELING

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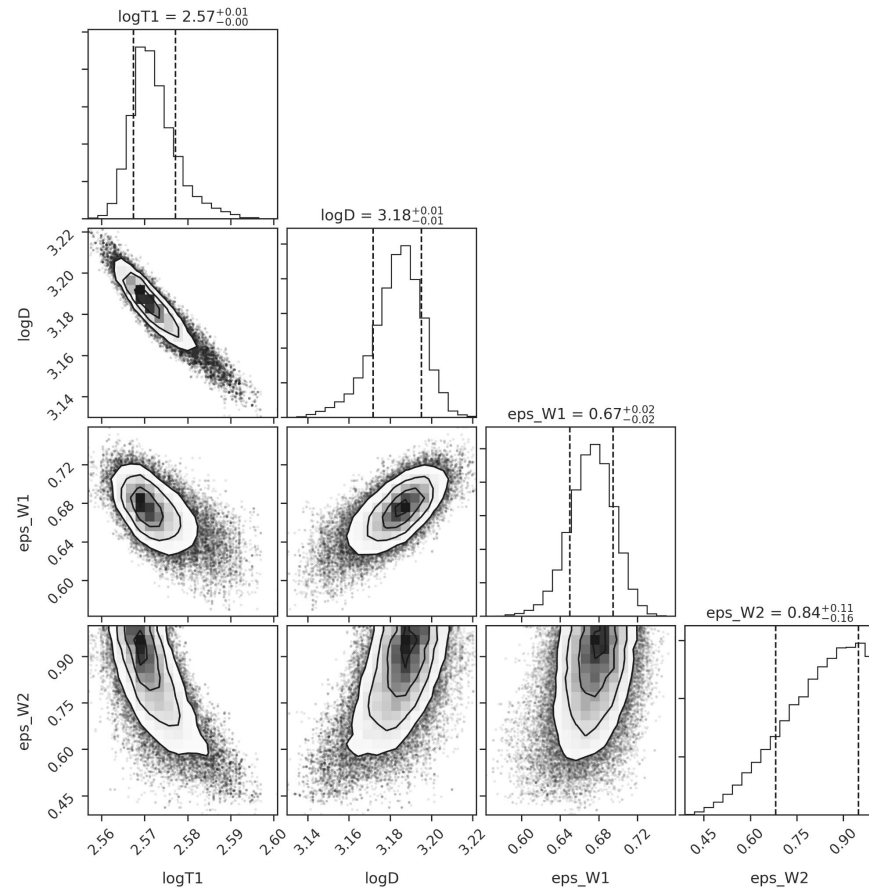
Asteroid Thermal Modeling (ATM)

Open-source Python tool for fitting of asteroid flux measurements with static thermal models (NEATM, FRM, STM)

Capability of Markov Chain Monte Carlo (MCMC) sampling of the posterior probability density function

Validated against sample of NEOWISE (2016) diameters and IR albedos

Diameters agree to within sub-percent bias (0.4%) and scatter of only 5.5%



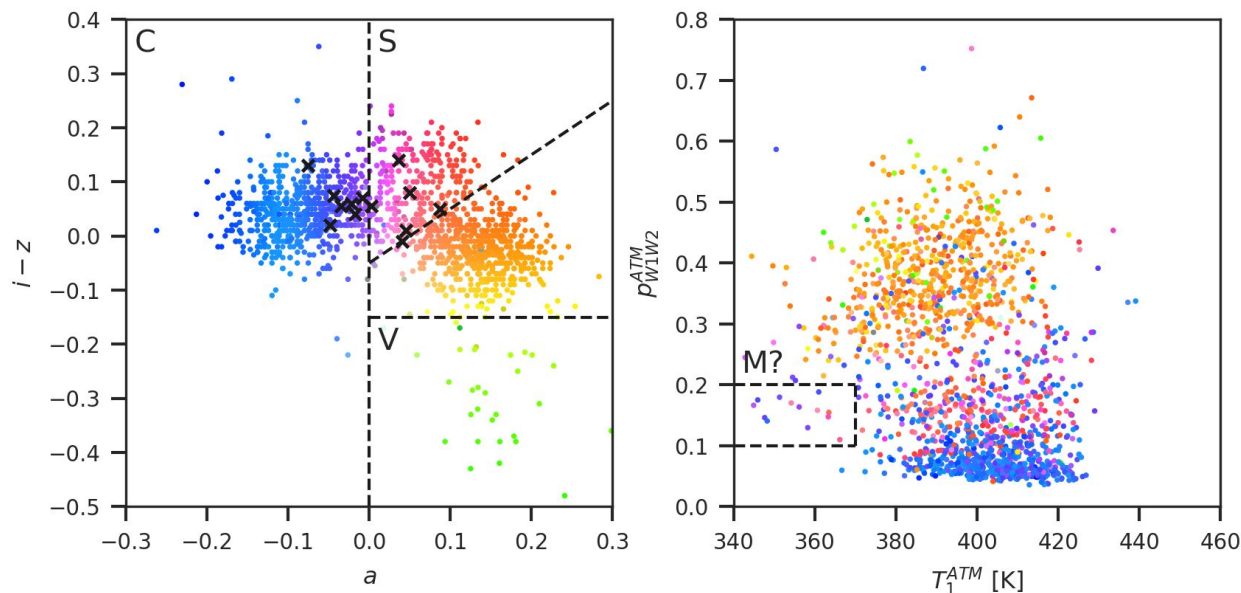
Posterior probability density function for sample object observed by WISE. Created using [single_object_54789.ipynb](https://doi.org/10.1016/j.icasus.2019.113575).

Finding Metallic Asteroids with ATM

High beaming parameter with low IR albedo are potential metal-rich asteroids (Harris and Drube 2014)

High beaming parameter corresponds to low characteristic temperature T_1

Identified 13 metallic asteroid candidates using ATM thermal fitting parameters



Simple selection criteria using ATM thermal modeling parameters can be used to identify metallic asteroid candidates. Created using [analysis_SDSS.ipynb](https://github.com/astorini/analysis_SDSS.ipynb).

Further Information



Reference Paper:

<https://doi.org/10.1016/j.icarus.2019.113575>



Code, Notebooks, Data:

<https://github.com/moeyensj/atm>

https://github.com/moeyensj/atm_notebooks

https://github.com/moeyensj/atm_data

