Model SED fitting

(or 'our bad data extraction algorithm')

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Why? (I)

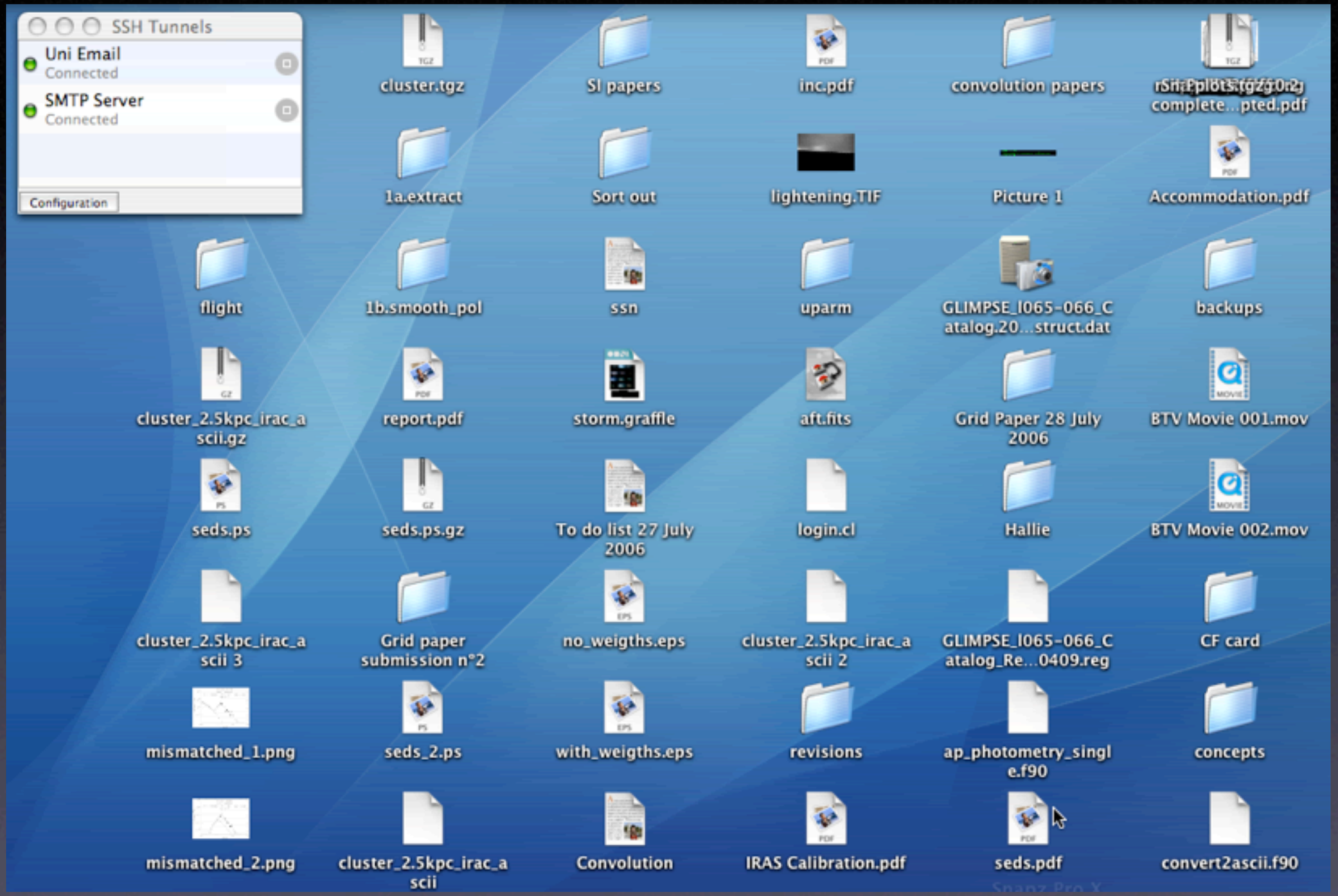
- Model SEDs or spectra are necessary to find synthetic colors (e.g. of YSOs)
- Analyzing how colors depend on various parameters, and comparing real colors to predicted trends is indirect
- Why not compare the models directly to all the data available for each source?

Why? (II)

- Optimal use of available data
- Find not only one set but many sets of parameters which fit data
- Avoid recomputing radiation transfer models for each source

How?

- Use pre-computed model SEDs for YSOs and stars.
  - ➡ 200,000 YSO model SEDs (Robitaille et al 2006)
  - ➡ 7800 PHOENIX stellar photospheres (Brott & Hauschild 2005)
- For each source:
  - ➡ Fit all models to minimize χ^2
  - ➡ Order in decreasing χ^2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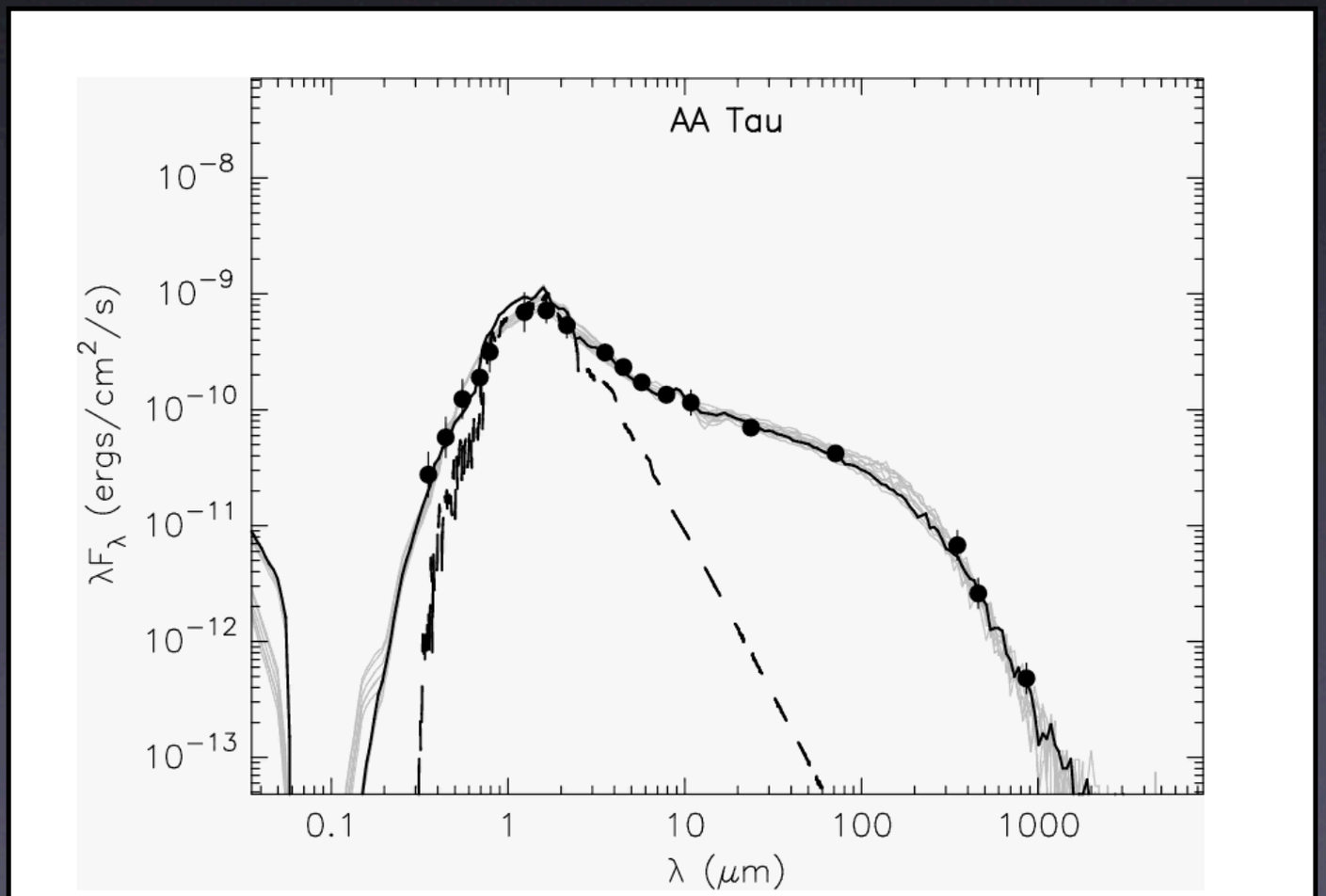
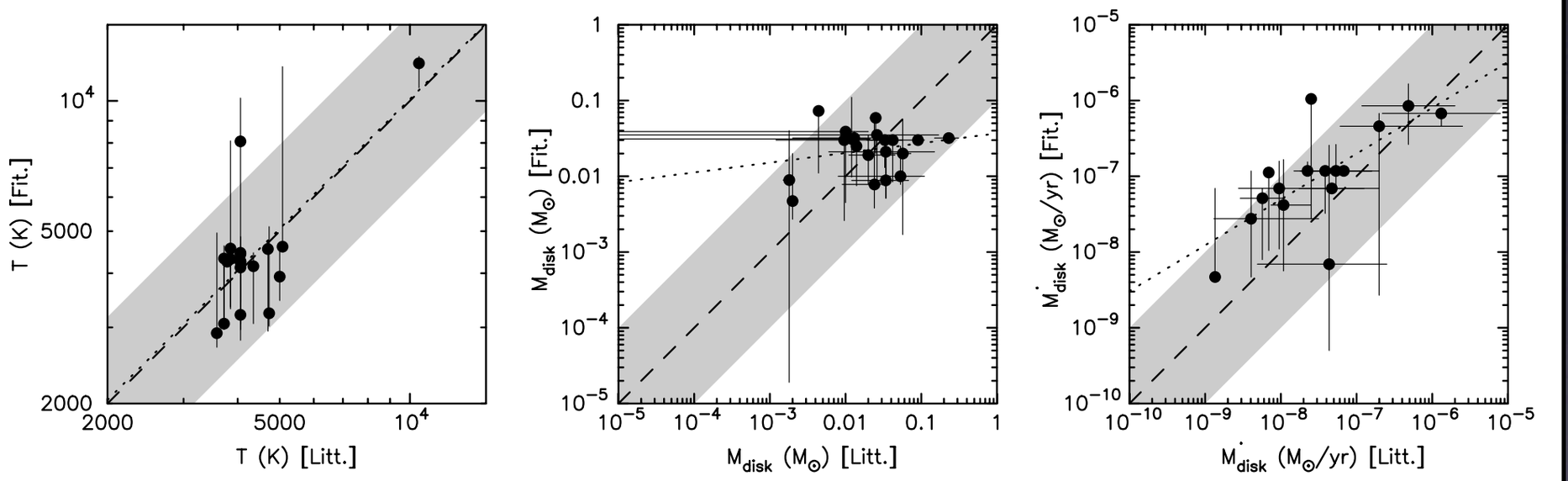
Does it work? (YSOs I)

- To answer this question, we have carried out an analysis of 30 known Taurus sources.

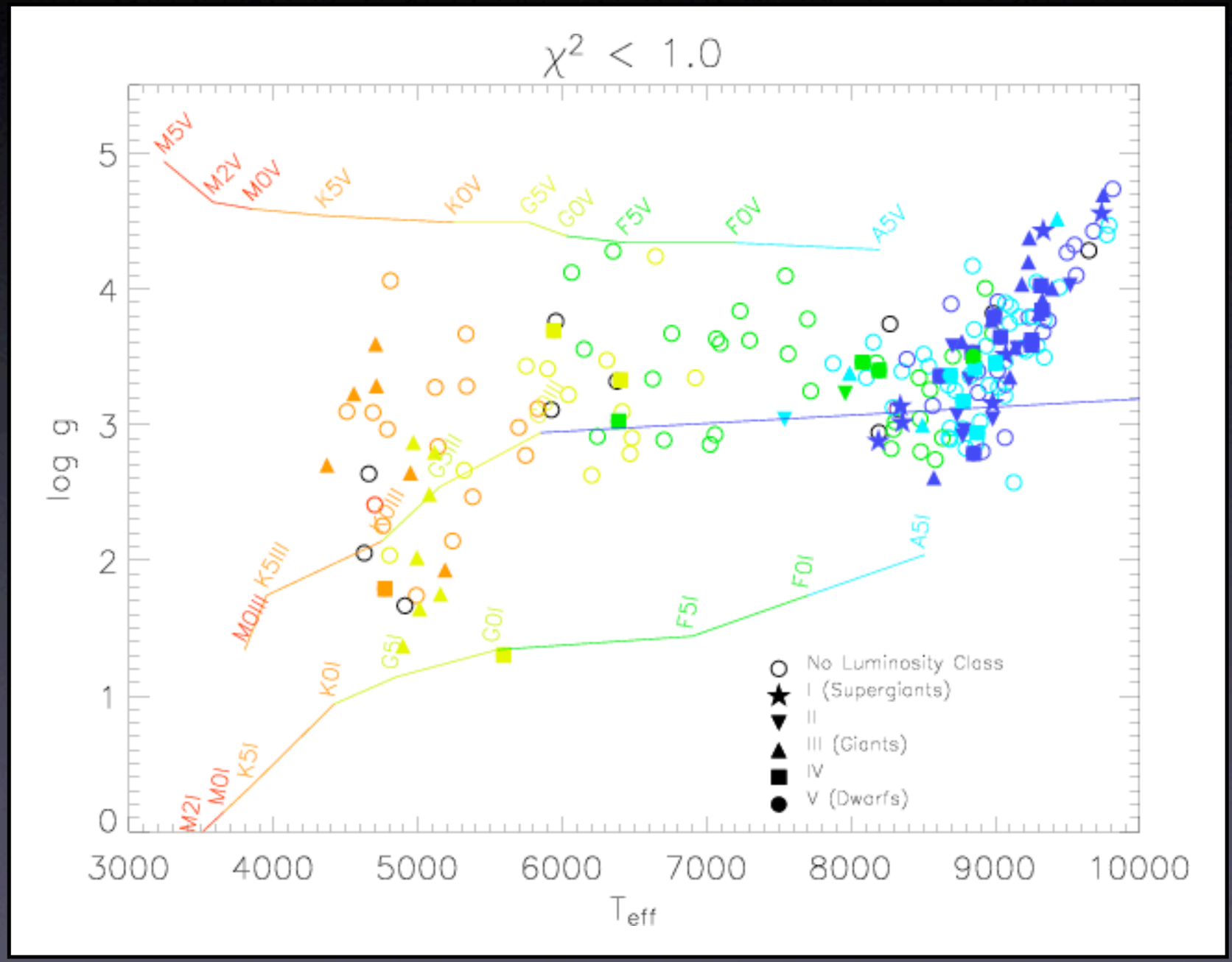


Does it work? (YSOs II)

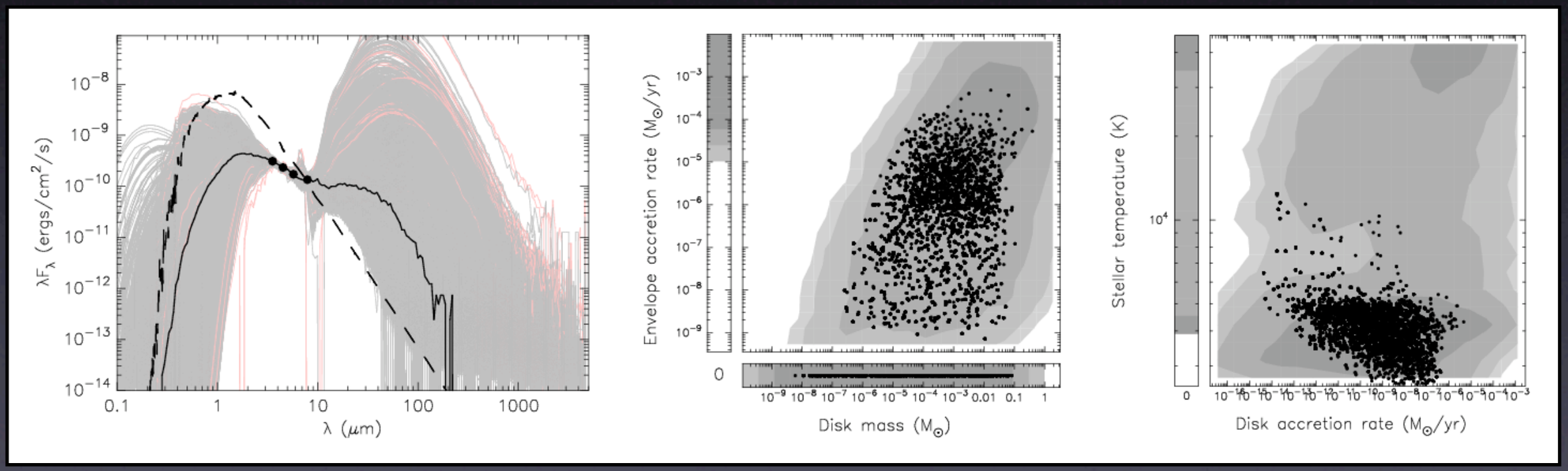
- We compared the parameter values of the good SED fits with independently determined physical parameters:



Does it work? (Stars)



What data do we need?



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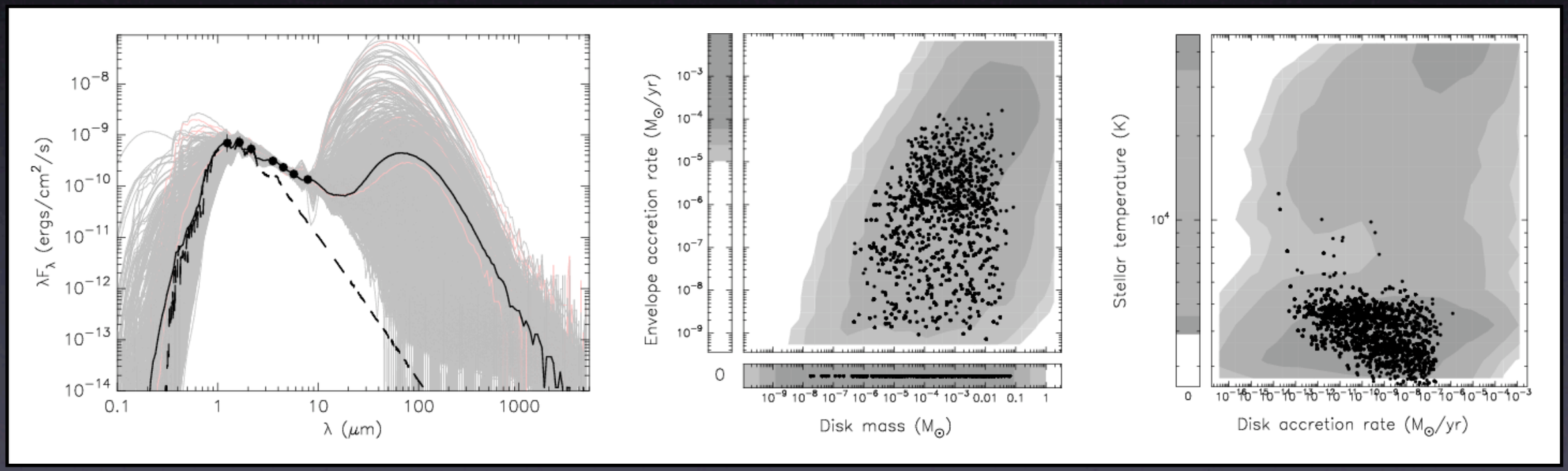

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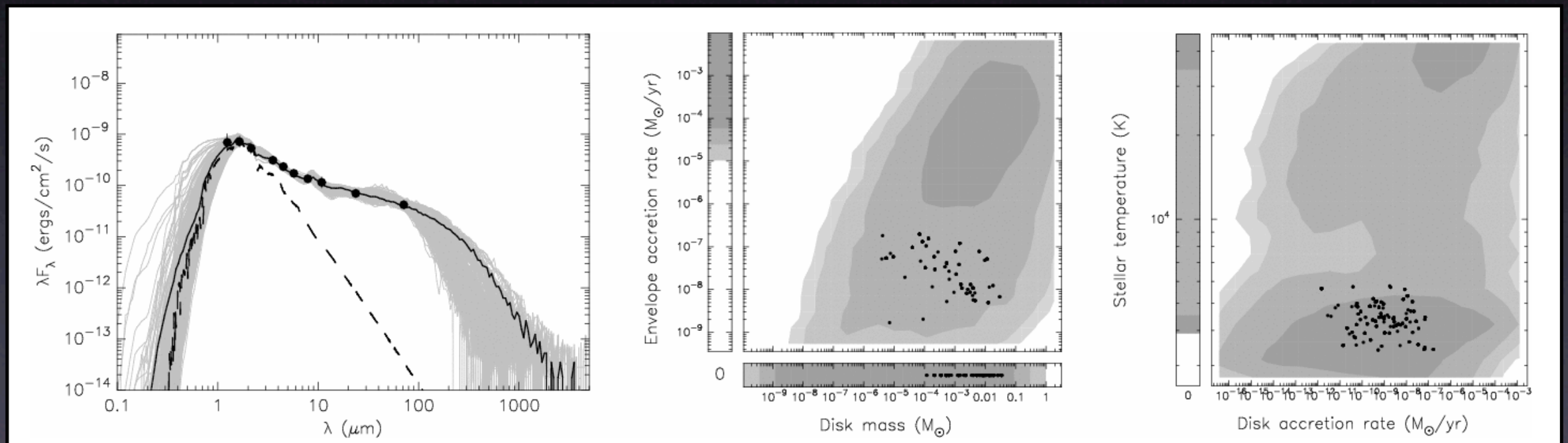

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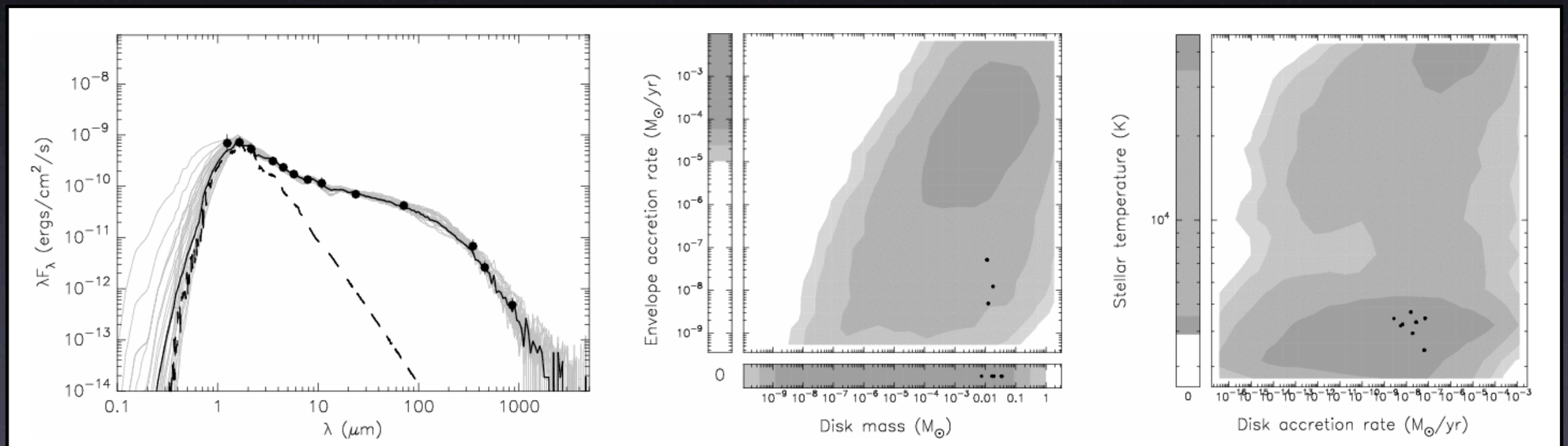

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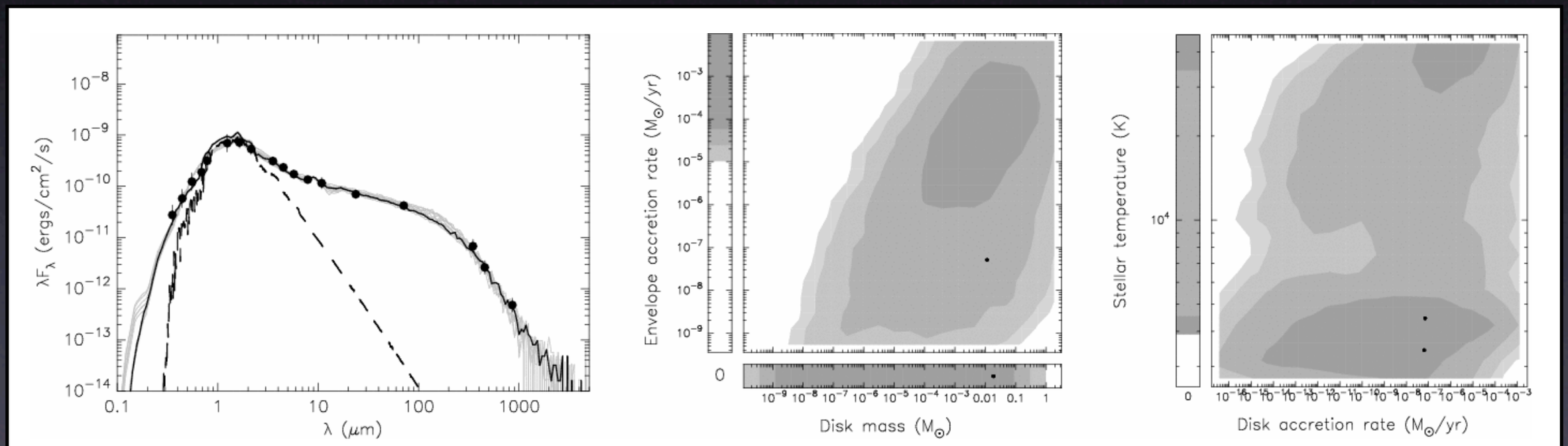

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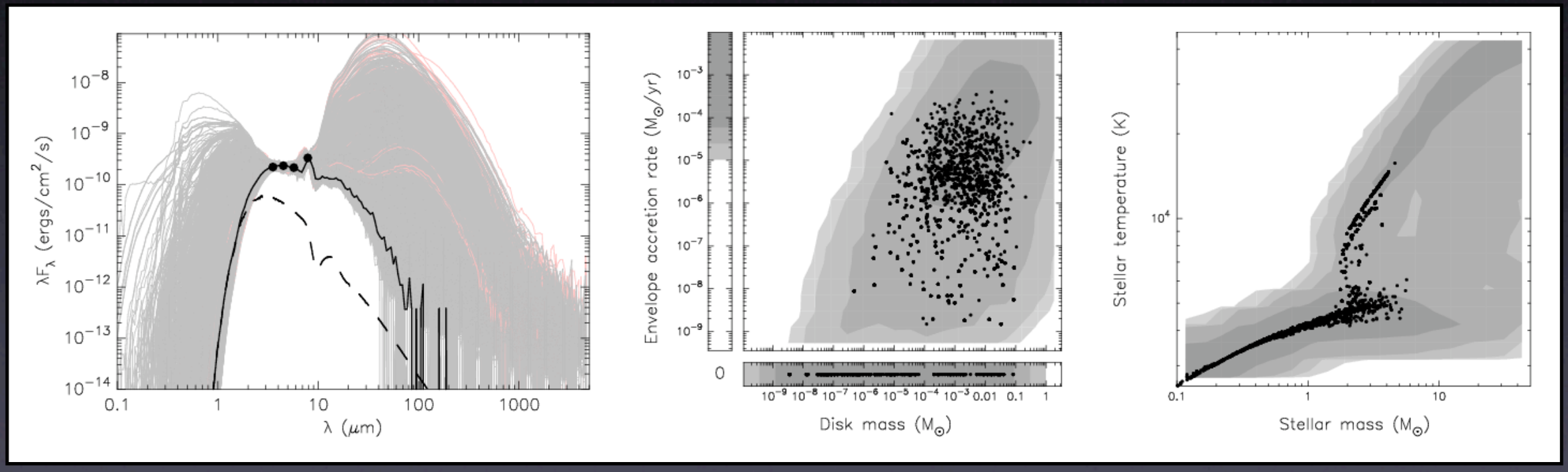

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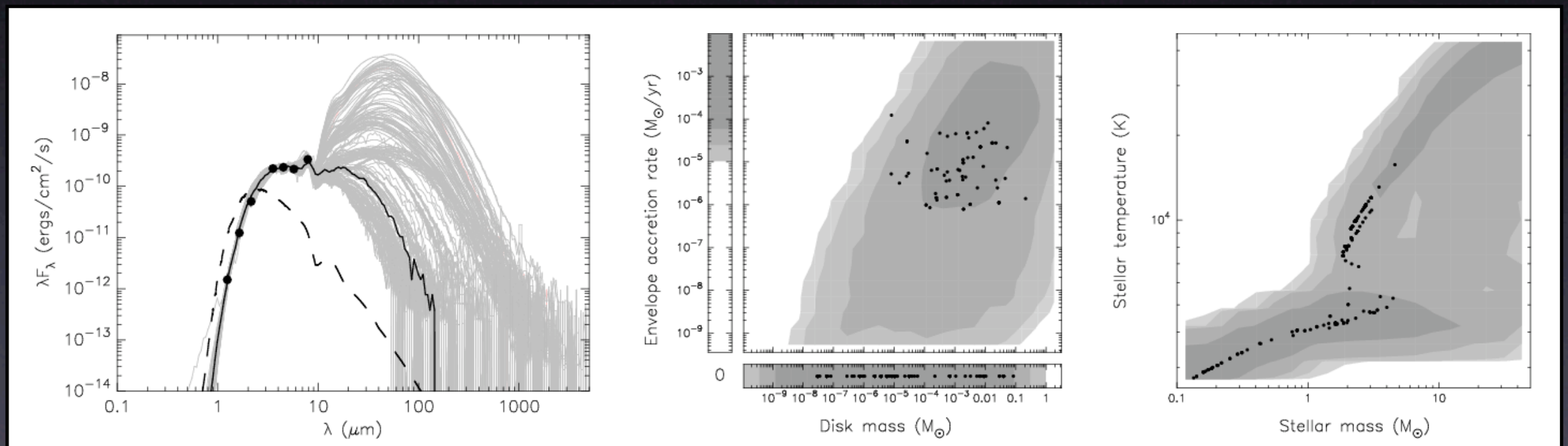

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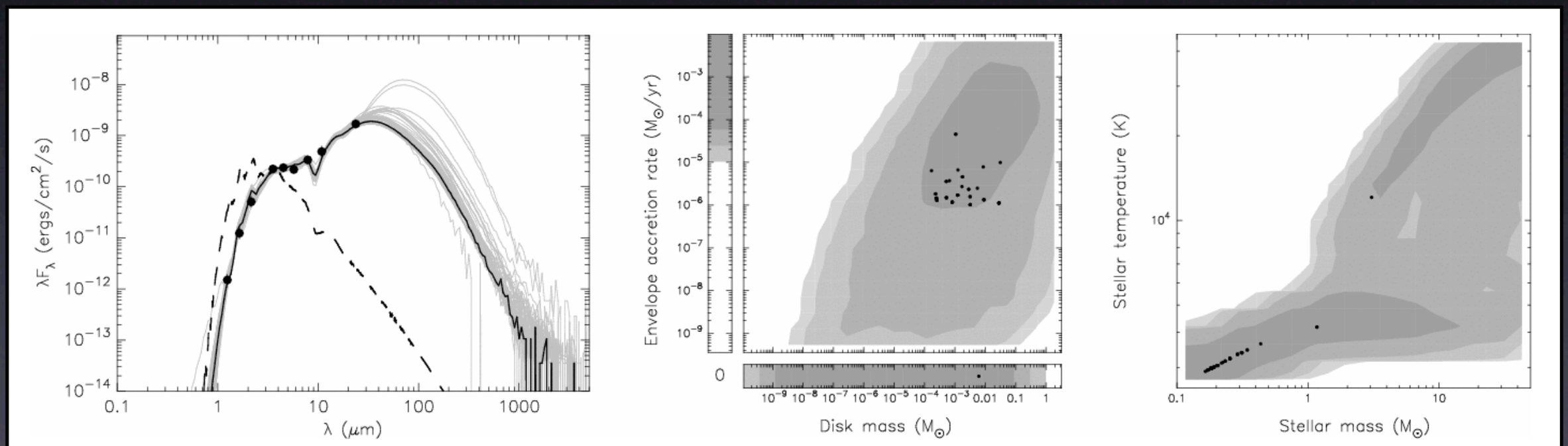

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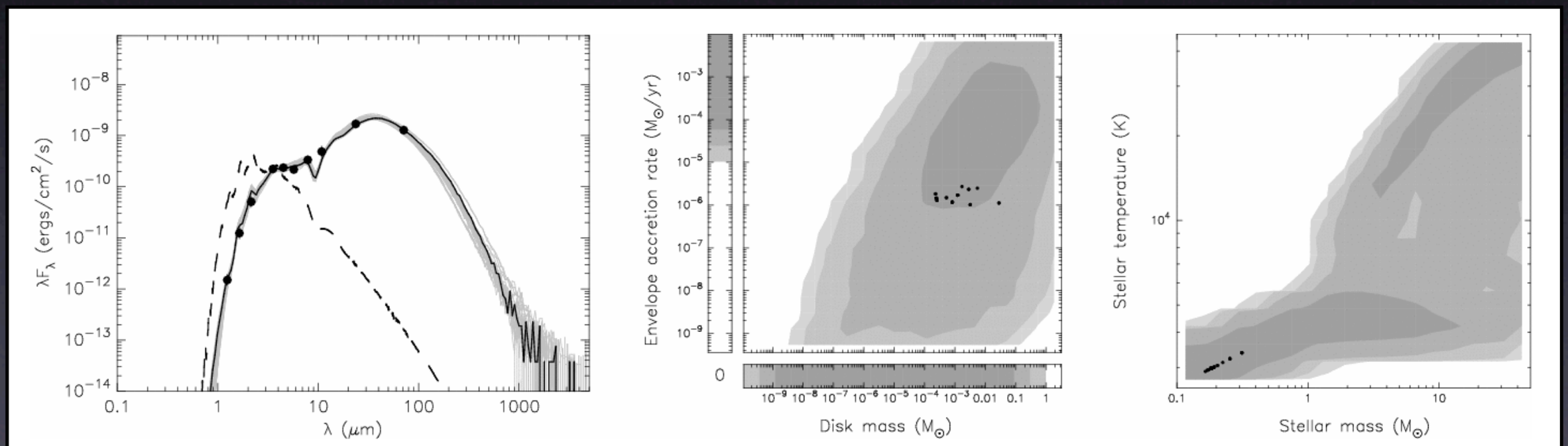

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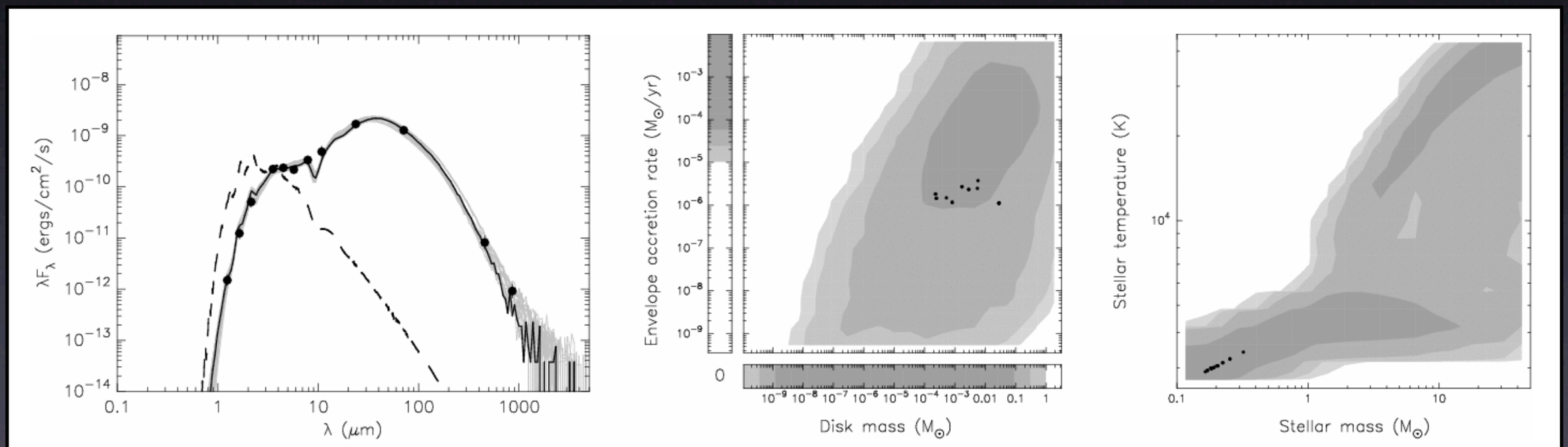
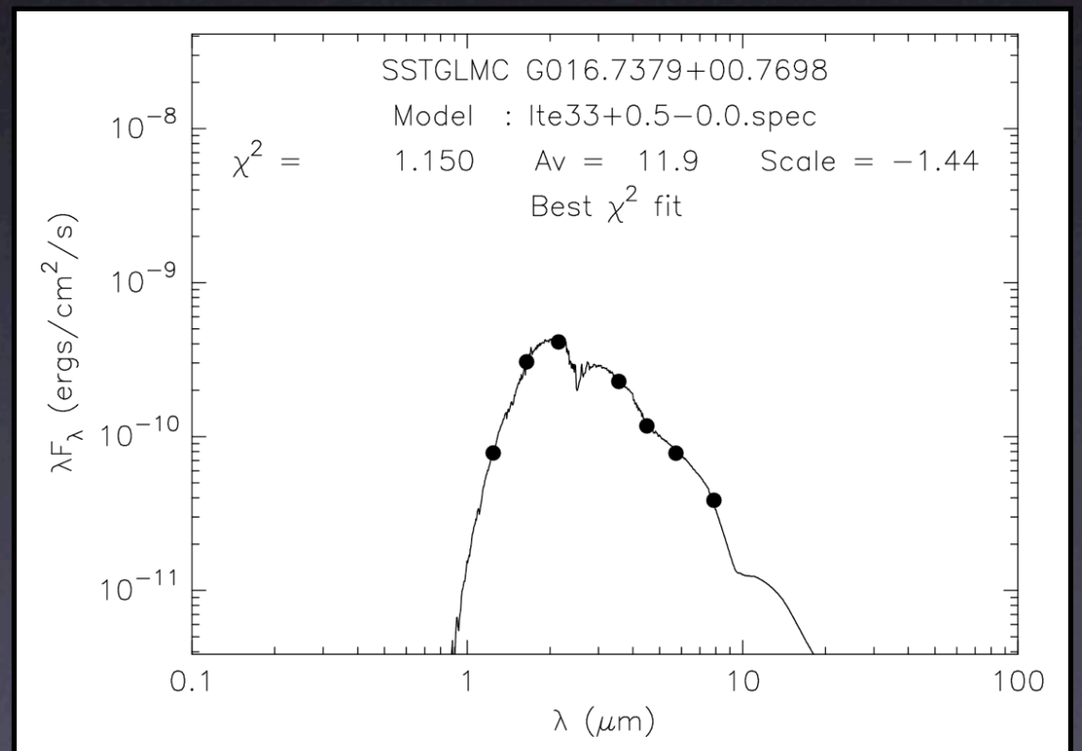
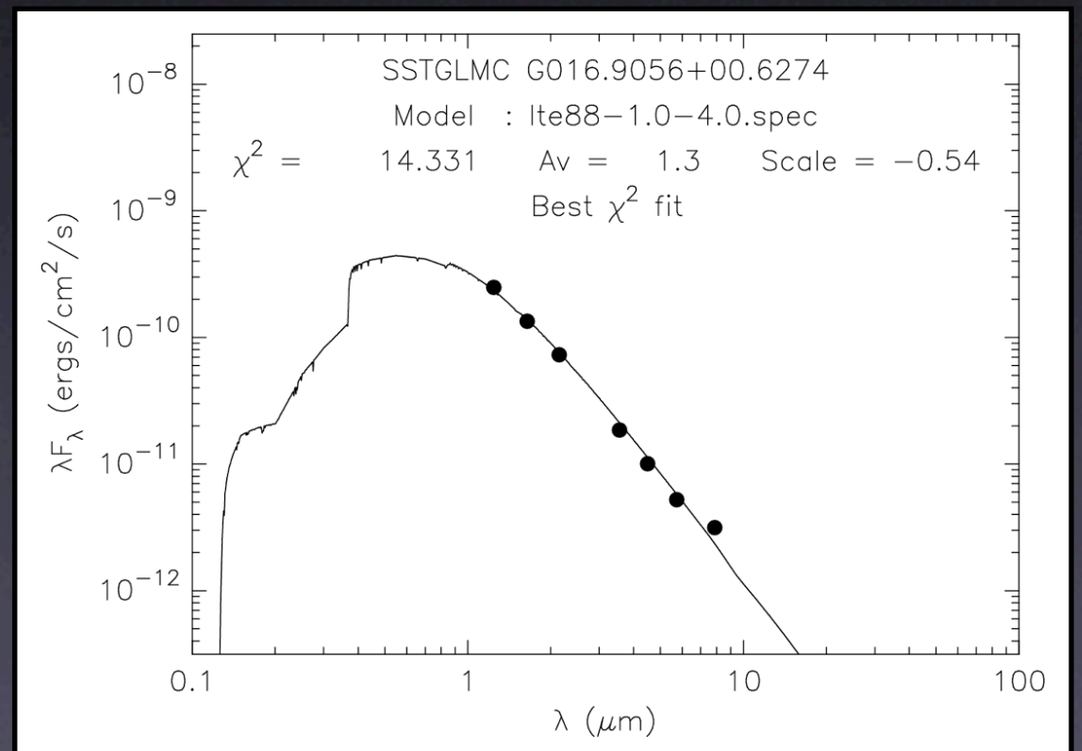


Application to GLIMPSE data

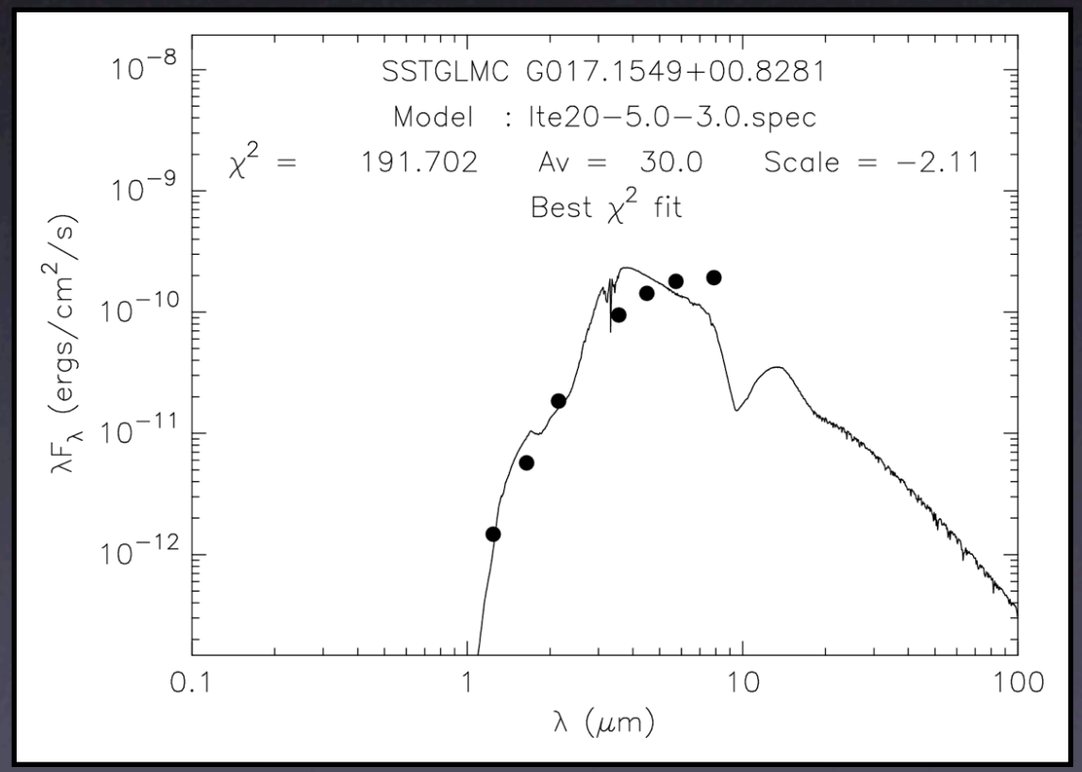
- Sources well fit by stellar photospheres:

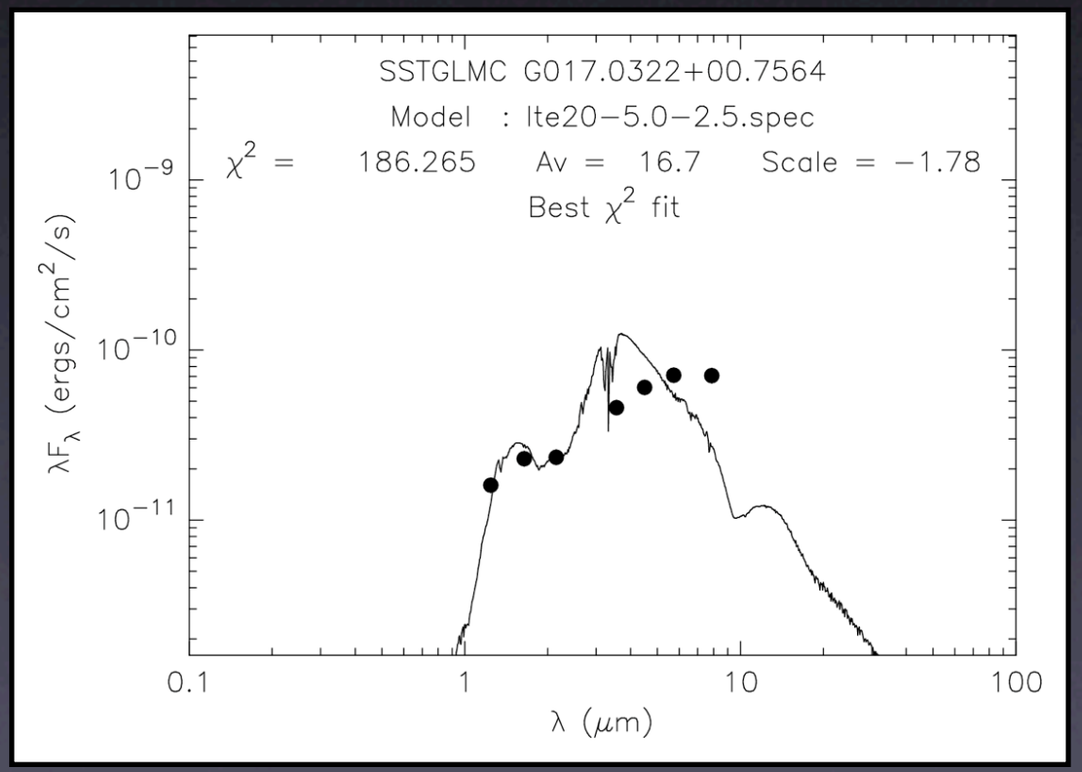




Application to GLIMPSE data

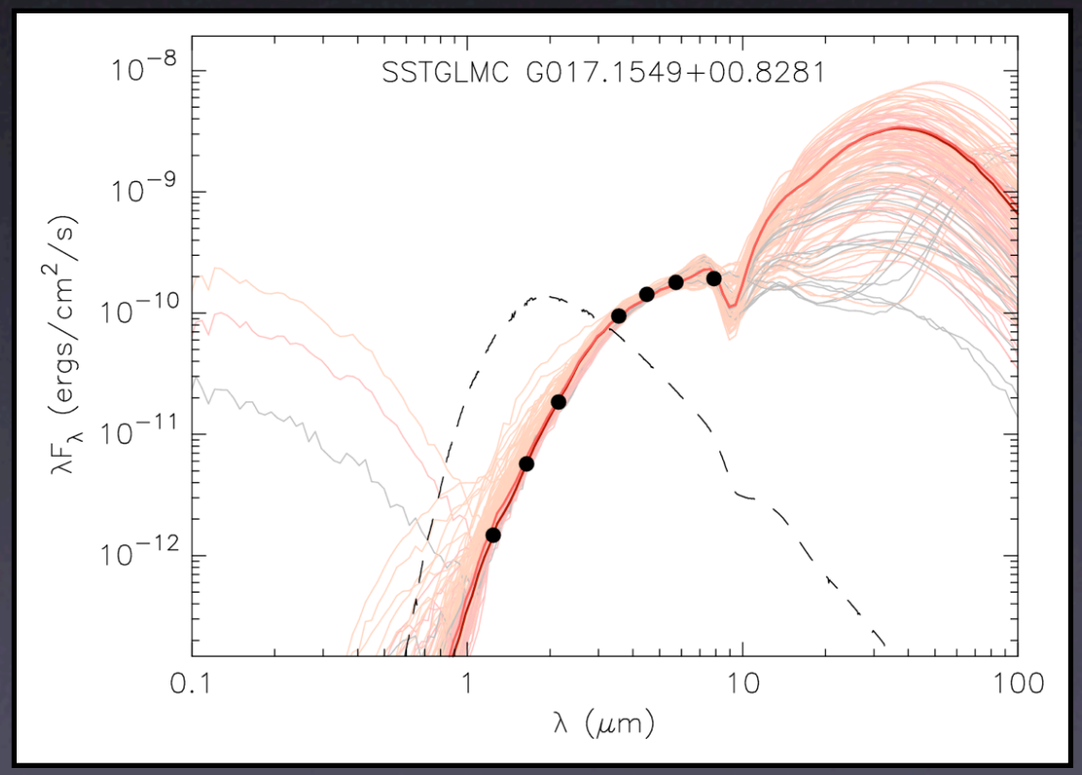
- Sources not well fit by stellar photospheres:

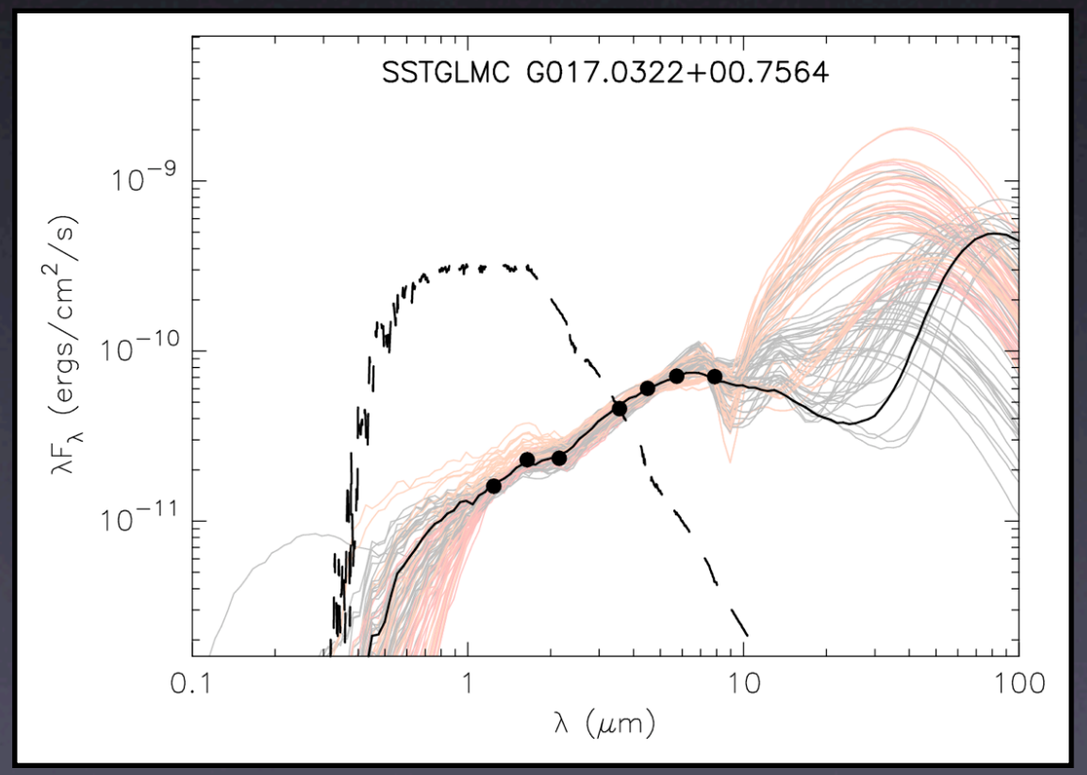




Application to GLIMPSE data

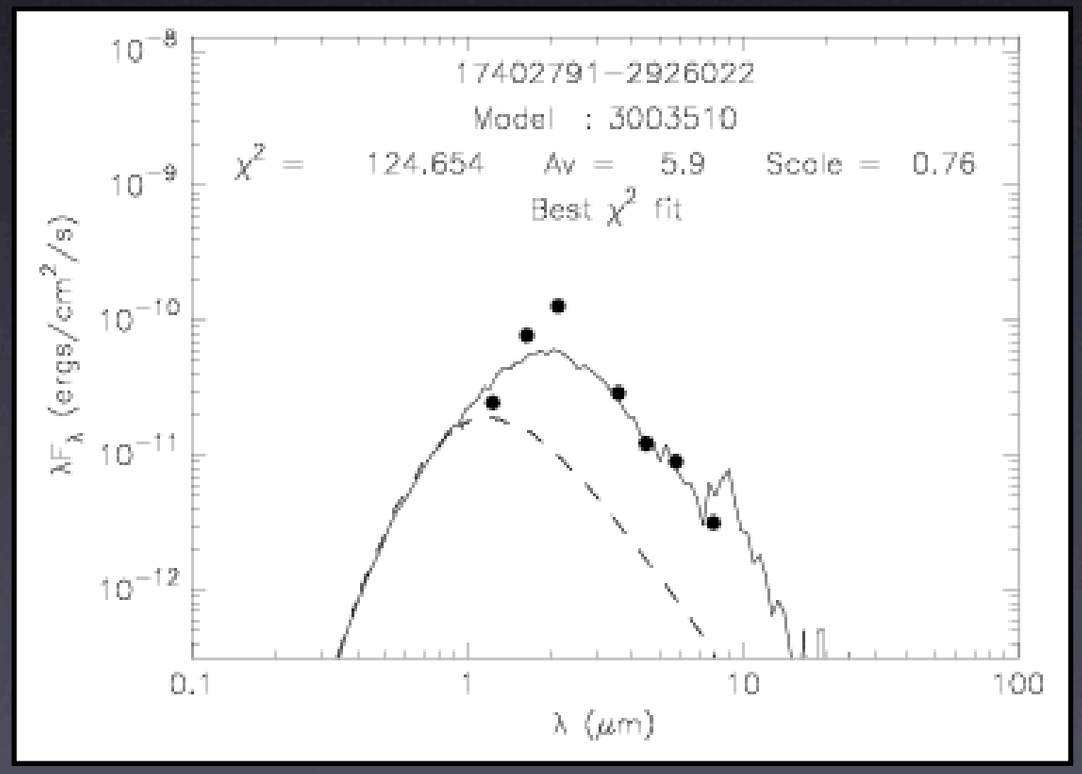
- But well fit by YSO model SEDs! :-)

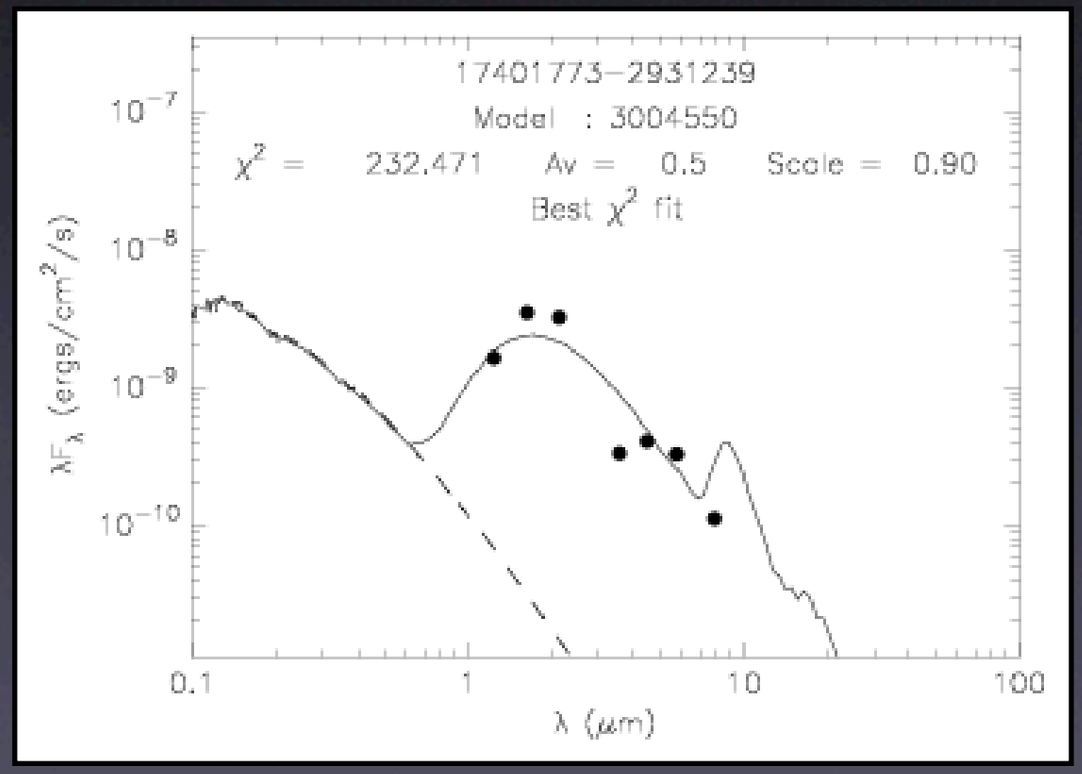




Application to GLIMPSE data

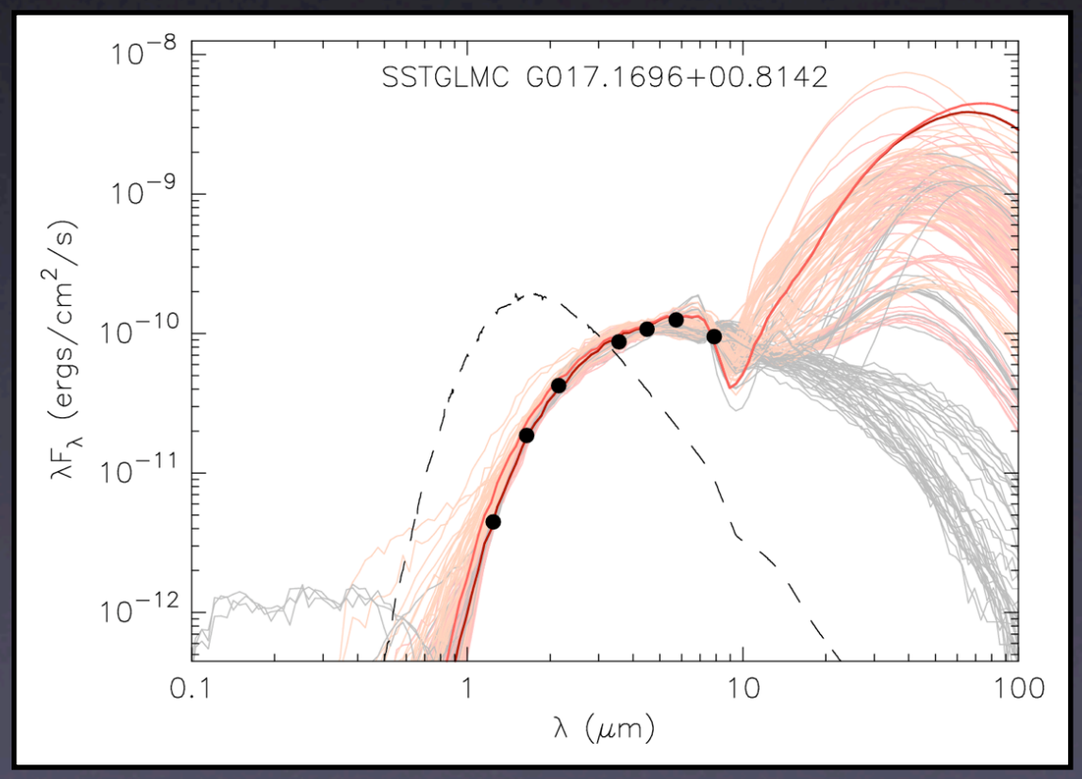
- Very successful in finding bad data!

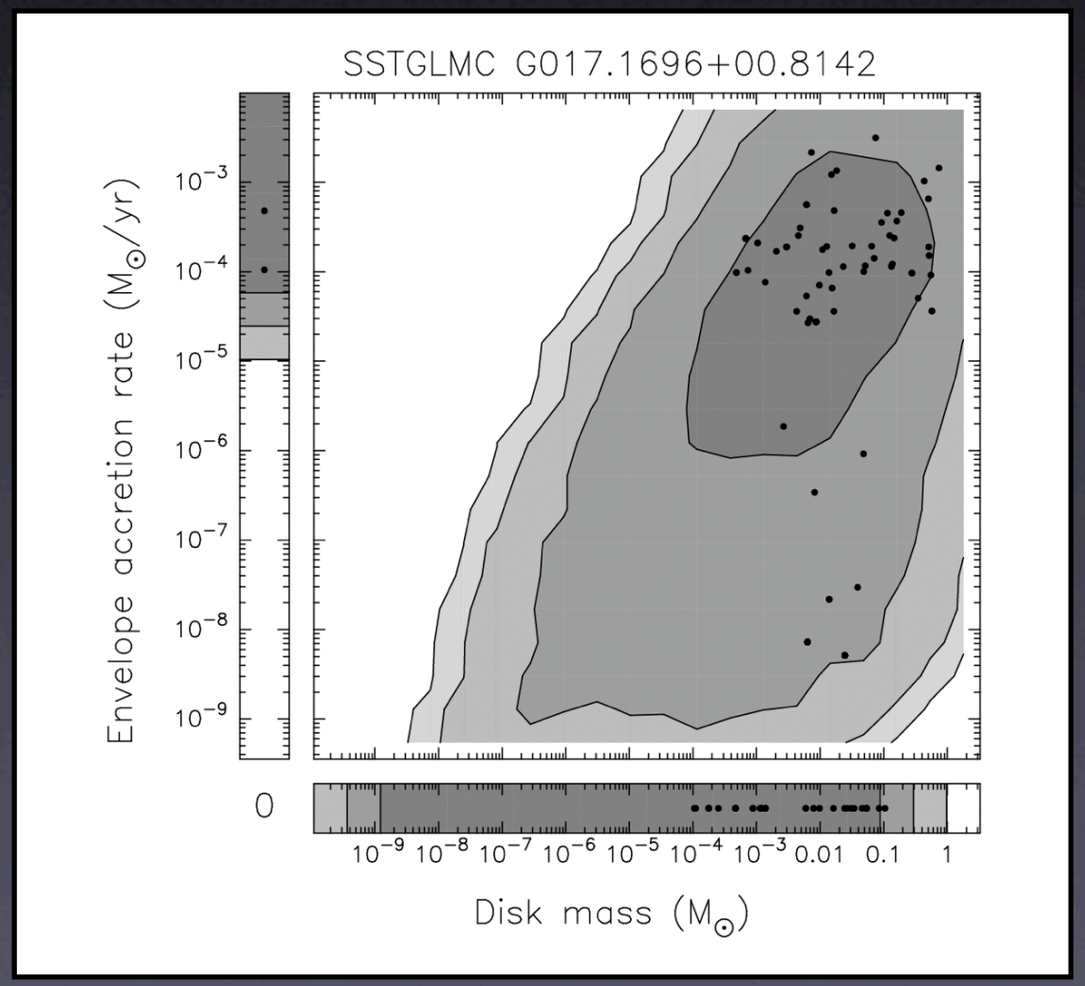




How well do we constrain evolutionary stage?

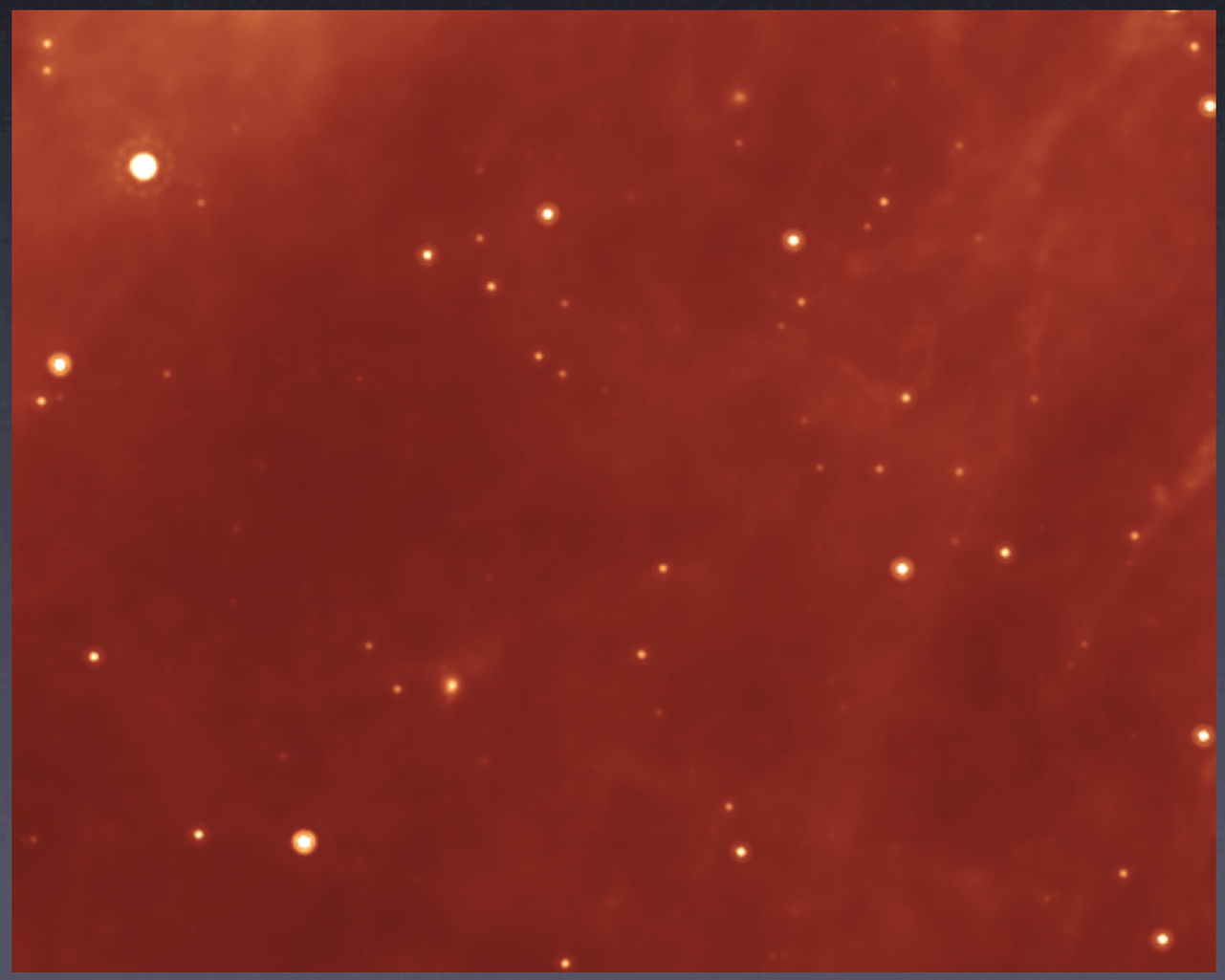
- Using only JHK and IRAC:





What if we add MIPS?

- New program to find MIPS upper limits and fluxes at the position of GLIMPSE sources:



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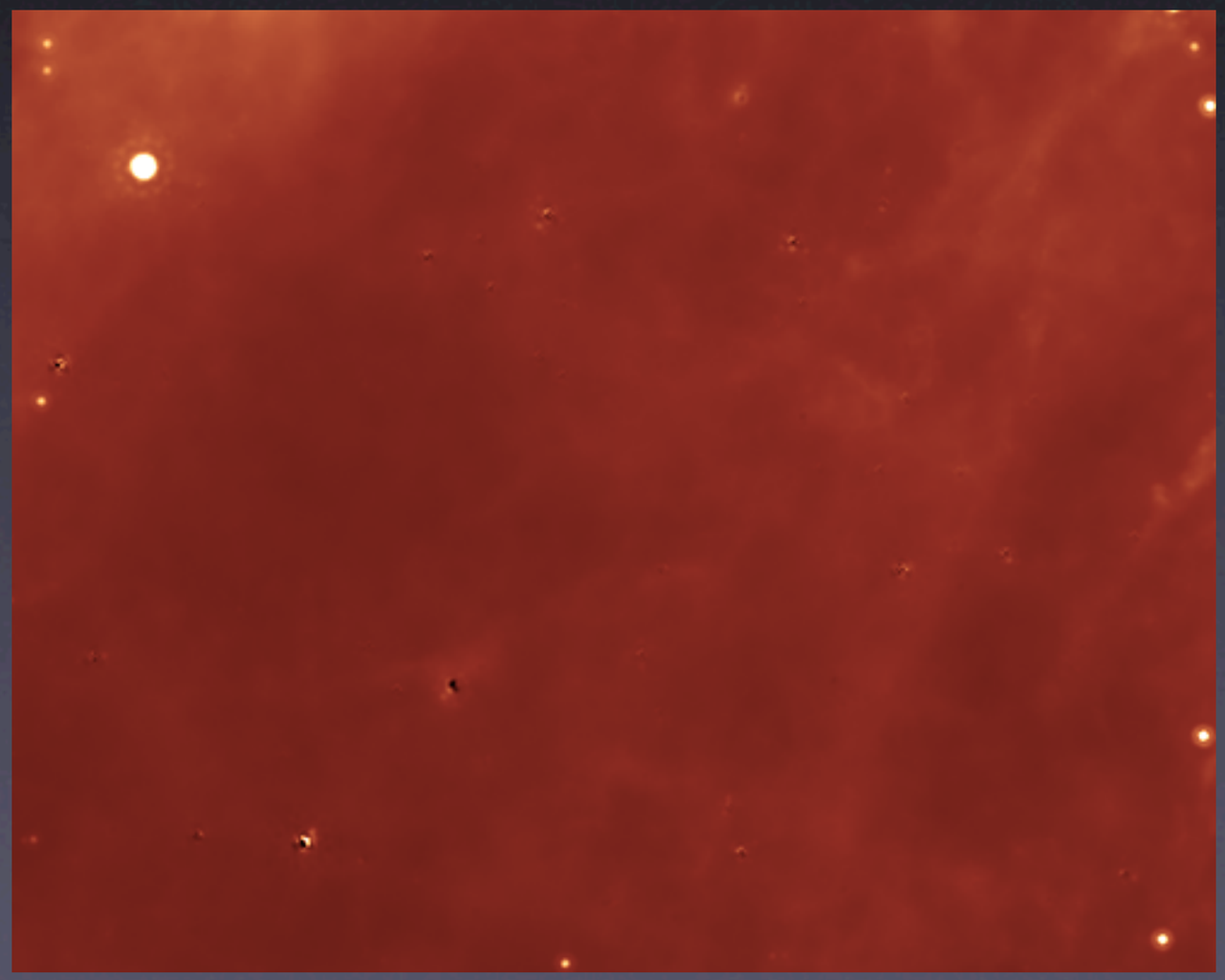

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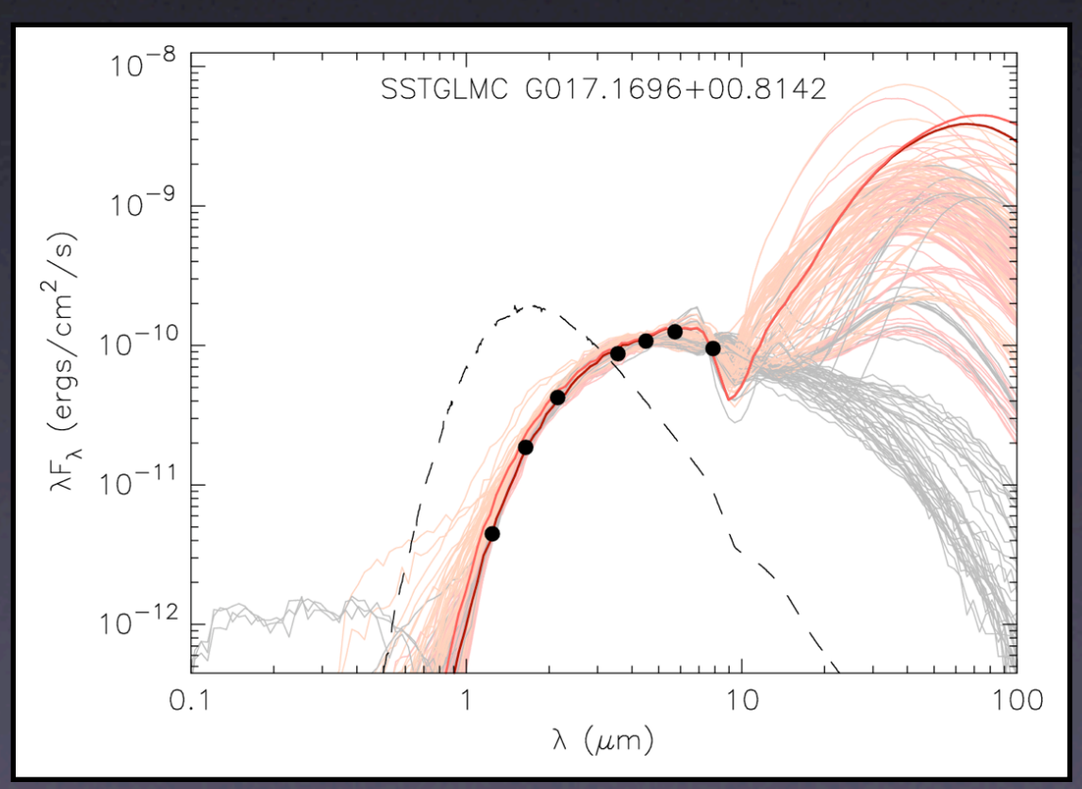

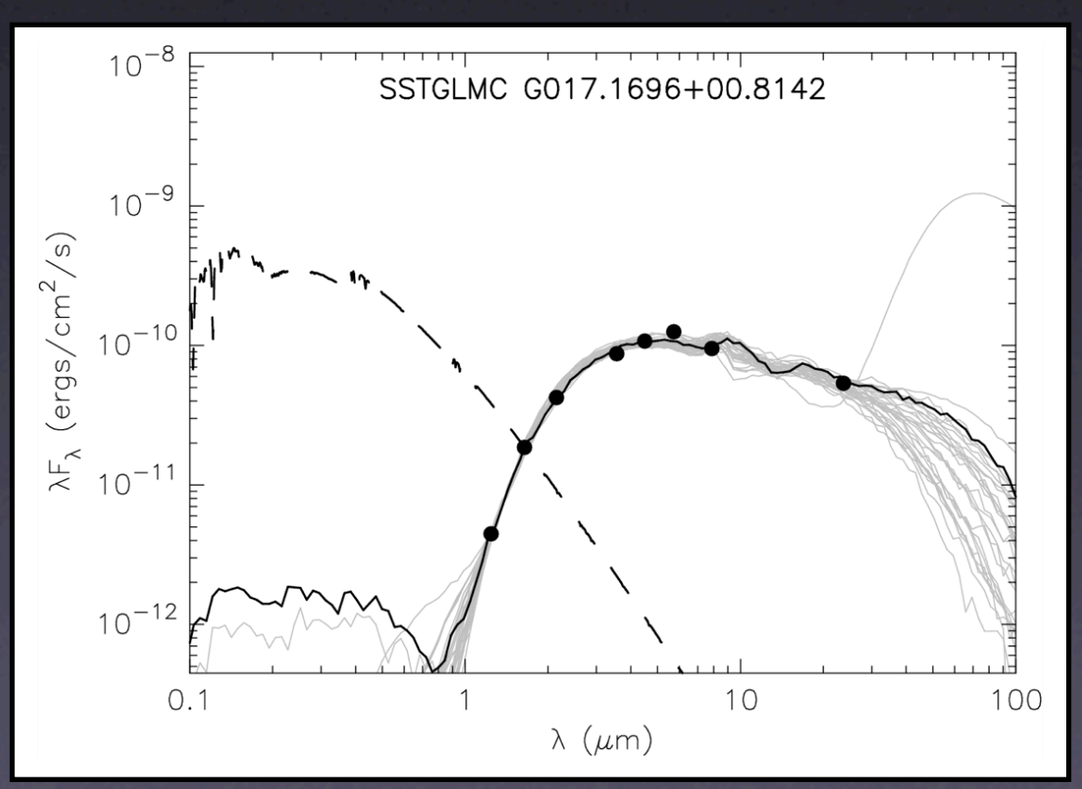

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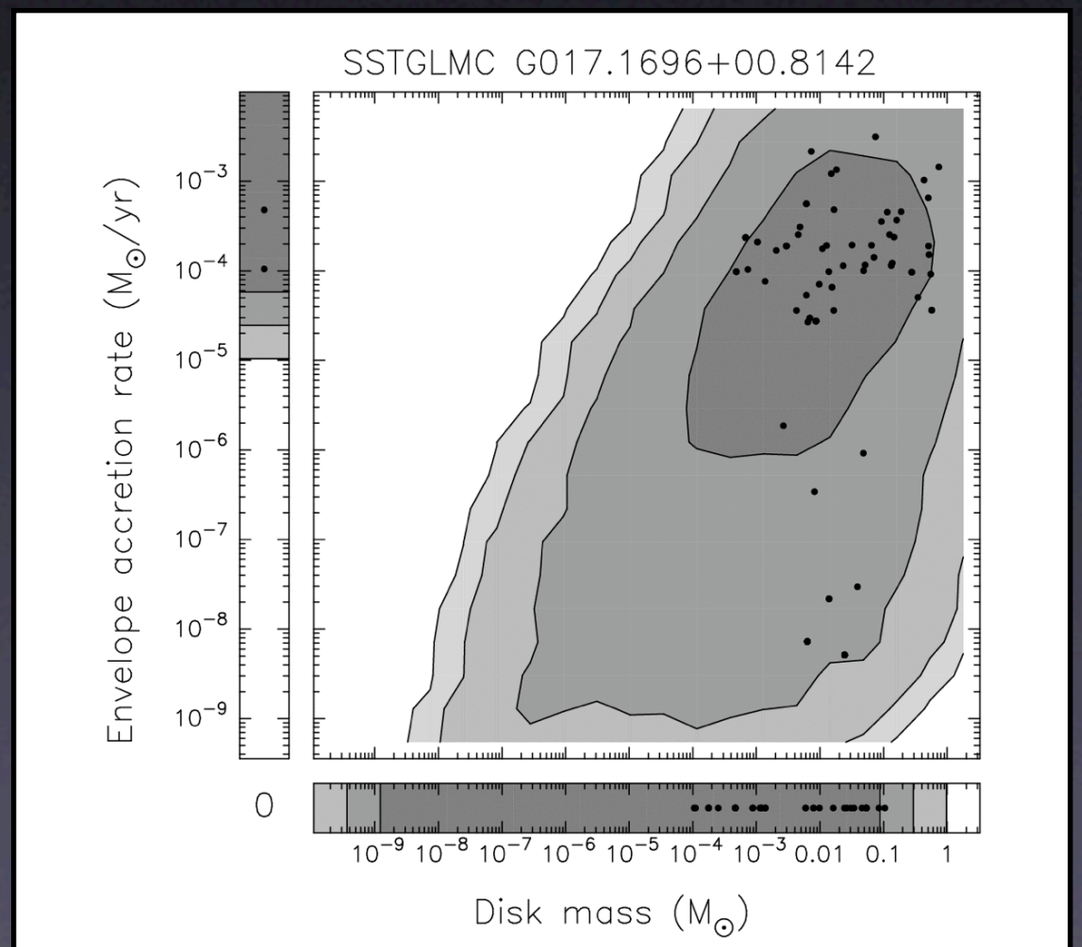

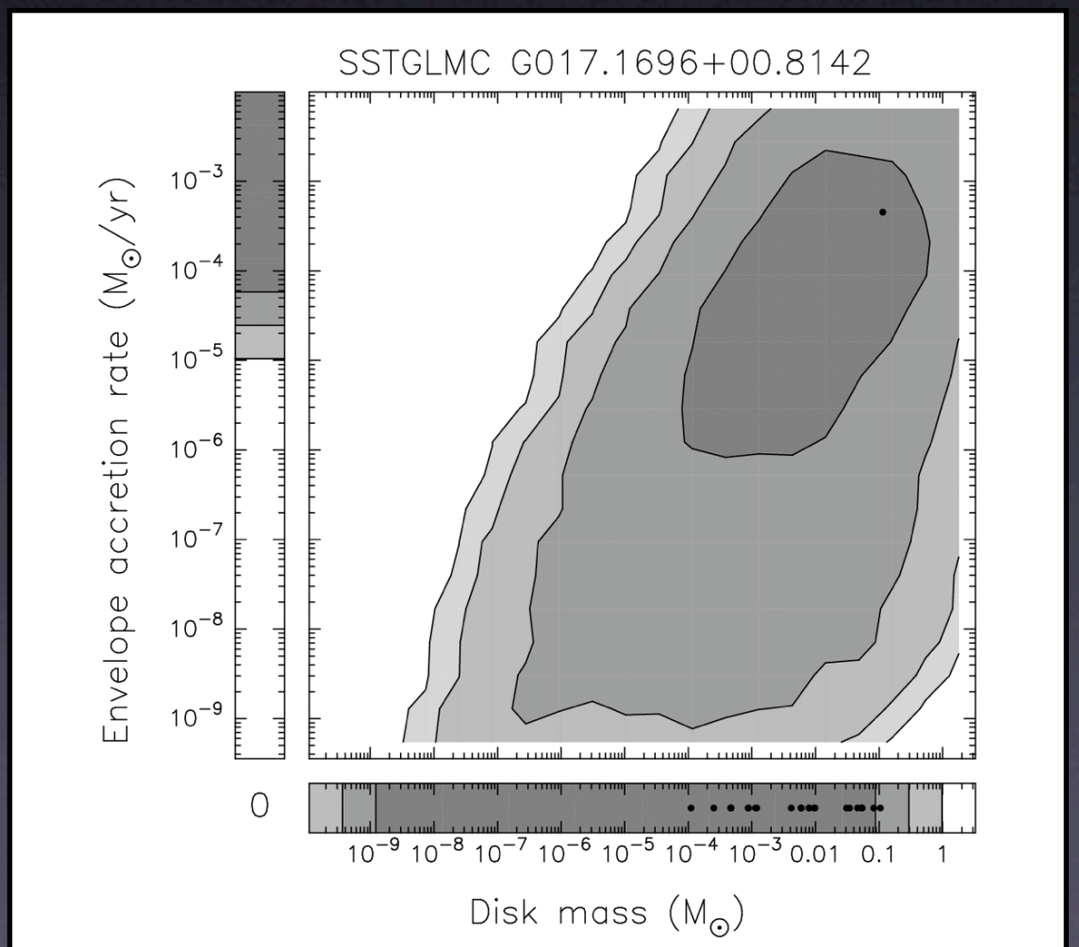

Summary

- We have developed a tool to fit stellar photospheres and model YSO SEDs to multi-wavelength data
- This will be useful in analyzing GLIMPSE data (and finding bad data!)
- Whenever possible, MIPS data should be used (even if sources are not detected, upper limits are useful).
- We are developing a tool to find MIPS fluxes and upper limits for existing GLIMPSE sources

Summary

- The YSO model SEDs and the fitting tool are available to the GLIMPSE team!