

Outline for FEPS IRAC paper, To be coordinated with other 30% papers (Kim, Bouwman, Carpenter?)

Plan A:

Summary Title: Near-Infrared Disk Frequencies from 3-30 Million Years: The IRAC View.

Lead/Deputy: Silverstone/Meyer

Suggested Co-Authors: Kim, Hines, Hillenbrand, Mamajek, Carpenter, Backman, Stauffer, other interested FEPS team members

Hypothesis: 3-8um Disk Signatures are rare by 30 Myr.

Brief Description: This paper will present the IRAC 3-band fluxes for 56 FEPS targets with ages ≤ 30 Myr, and will seek trends of excess with systemic age. This data set will place into the context the fraction of systems with IRAC-detected disks with the results of Haisch et al. 2001 (6 Myr lifetime of JHKL-detected disks), Mamajek et al 2004 (N-band detected to ~ 10 Myr) to comment on the prevalence of exo-zodiacal clouds, and their potential relationship to planet formation and evolution.

We may also comment on our sensitivity to transition objects, as we search for the time when optically thick disks become optically thin, and attempt to identify objects which are currently spanning these evolutionary states.

Rough age breakdown for the 56 youngest FEPS targets with IRAC data in hand, a super-set of the age bins to be used in section 4.B.ii

Age range	# stars in bin
$t < 10^6$	2
$10^6 \leq t < 10^{6.5}$	9
$10^{6.5} \leq t < 10^7$	16
$10^7 \leq t < 10^{7.5}$	29

1. Introduction

A) brief description of FEPS project, refer to e.g. First Results paper

B) brief summary of near-IR & Mid-IR observations of zody, its evolutionary state
e.g. Haisch et al. 2001 & Mamajek et al. 2004

C) brief description of significance of this sample vs. 100% FEPS sample

2. Observations

A) define observed target sample: 56 FEPS targets with $\log \text{age} \leq 7.5$

i) Brief literature review: Refer to LAH paper

ii) Summary of stellar properties of the sample, presented with a table

iii) Age determinations, classification, evolutionary state

iv?) *Multiplicity, metallicity, variability, etc.?*

B) description of IRAC Observations

3. Data Reduction methods & error analysis

A) description of IRAC data reduction cookbook (future papers will refer to this section)

B) description of statistical and photometric propagation of errors, special calibrations?

4. Results

A) define excesses:

i) Photospheric models: refer to JMC Paper?

ii) Give BRIEF description here

B) characteristics of of excesses

- i) Plot color-Color diagrams
- ii) Plot Fraction of systems in appropriate age bin with detected excess
- iii) discuss dust mid-plane optical depth?
range of temperatures/radii?

C) SEDs of any interesting systems?

5. Discussion, Interpretation & Future work?

A) upper-limits dust mass estimates (similar to Mamajek et al).

B) place trends in context

i) compare results to Haisch 2001 & Mamajek 2004

ii) compare statistical significance of trends with prevalence of systems in the

galaxy

iii) future expansion of study to longer wavelengths:

Asteroid belts?

iv) implications of planets/planetary formation

C) propose follow-up investigations and refer to planned publications

e.g. FEPS 100% paper

i) predict power of further observations, hooks into proposals?

ii) ground-based imaging, space-based imaging? variability?

iii) further sub-mm observations

6. Summary and Conclusions

A) enumeration of results

B) evolutionary context/implications for planet formation timescales

Acknowledgements

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References

Haisch, K. E., Lada, E. A., & Lada, C. J. 2001, ApJ, 553, L153

Mamajek, E. E., Meyer, M. R., Hinz, P. M., Hoffmann, W. F., Cohen, M., & Hora, J. L. 2004, ApJ 612, 496

Meyer, M. R., et al. 2004, ApJS, 154, 422

Tentative Schedule:

Oct 27 (Wed)

Email outline + tentative schedule to core author list

Oct 29 (Fri)

Core Authors reply with thoughts and/or suggestions, iterate on/agree to delegated tasks for paper

MDS sends initiates dialog on core science result with authors

Nov 1 (Mon)

Email outline to entire FEPS Team to invite broader participation in science paper

Core authors respond with comments on science result in preparation for Nov 3 talk, Nov 9 poster

Nov 3 (Wed)

MDS gives 30 minute Steward internal talk about core science result

Nov 4 (Thurs)

MDS provides authors with complete draft of New Views poster

Nov 6 (Fri) Deadline for poster comments

Nov 7 (Sat) MDS prints out New Views poster

Nov 8-12 (Mon-Fri)

Spitzer Calibration Workshop + Poster at Spitzer New Views conference

Nov 15-23

Iterations on paper drafts

MDS ramps up further data reduction tasks

Nov 24-28 Thanksgiving Break