

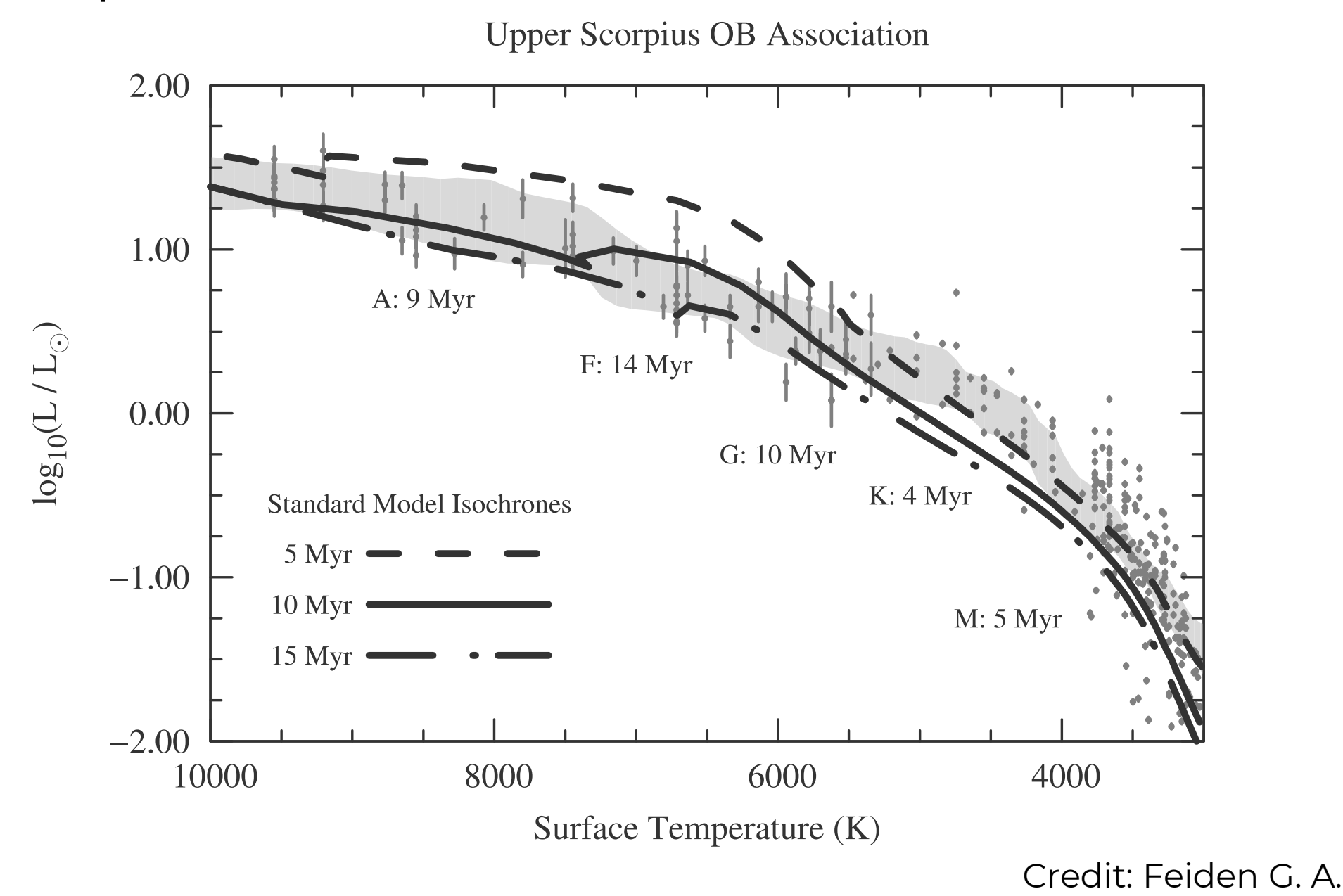
A Flexible Model for Investigating Properties of Starspots

Comparison of Models to Observed Data

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Introduction

Stellar models fail to provide consistent age estimates for young open clusters, with uncertainties being further exasperated by late-type cool stars.¹ It has been suggested that a source of discrepancy between the models and the observed properties of late-type stars is a variation in the stellar properties due to starspot activity.¹ By comparing cluster properties to flexible starspot models, we aim to define starspot parameters for various mechanisms of starspot formation.

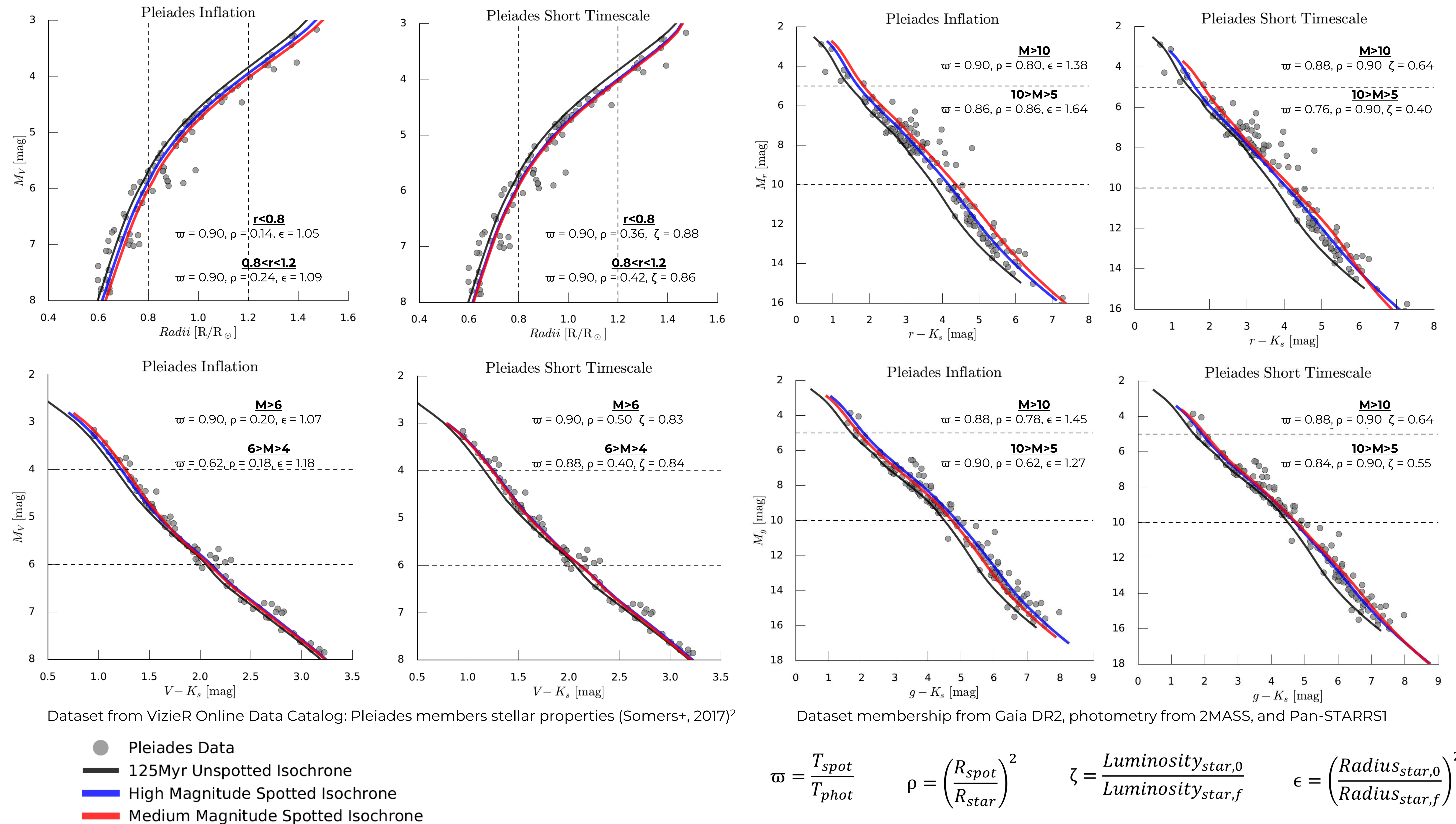


Method

We compare predictions from a flexible starspot model (poster 125) to photometric data from various open clusters. Using a chi-square minimization based on radial distance from the observed point to the model predictions, we are able to determine which starspot parameters provide the best fit.

$$\chi_r^2 = \frac{\sum \frac{d_i^2}{\sigma_d}}{\# \text{ of points}}$$

The observed data points are divided into bins by magnitude or radius, and independently fitted. This process is repeated for each class of starspot models.



Conclusions

- The Heated photosphere starspot models are unable to replicate observed trends.
- Difficult to distinguish between the inflationary starspot models versus the short timescale starspot models:
 - In CMD, the inflationary models provide lower surface coverage, but short-timescale models are more consistent with expected temperature contrast values.^{3,4}
 - Temperature contrast between the models is similar in radii-magnitude with the inflationary model being favored with lower surface coverage.
- Unresolved binaries and effects due to reddening may shift results from the unspotted model.
- Augmented with validation tests (poster 85), this implies the possibility of lower surface coverage than predicted.

About



Amanda is in her second year of undergraduate work at The University of North Georgia. She will be present at COOL STARS 20 on Tuesday(7/31).

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