# Stella

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## ABSTRACT

Some stuff

*Subject headings:* stars: fundamental parameters — stars: abundances

## 1. Introduction

## 2. Model

The asteroseismic scaling relation for mass is

$$\frac{\mathcal{M}}{\mathcal{M}_\odot} \approx \left(\frac{\nu_{\rm max}}{\nu_{\rm max,\odot}}\right)^3 \left(\frac{\Delta\nu}{\Delta\nu_\odot}\right)^{-4} \left(\frac{T_{\rm eff}}{T_{\rm eff,\odot}}\right)^{3/2} \quad , \tag{1}$$

but just how wrong is this?

Our model has the following parameters (summarised as $\theta$): Current mass $\mathcal{M}_{now}$, distance $d$, initial mass $\mathcal{M}_{init}$, stellar age $\tau$, photospheric metallicity [Fe/H], and effective temperature $T_{\rm eff}$.

$$\theta = (\mathcal{M}_{now}, d, \mathcal{M}_{initial}, \tau, [{\rm Fe/H}], T_{\rm eff}) \tag{2}$$

The observables (data $\mathcal{D}$) are parallax $\varpi$, apparent $J$-band magnitude, and apparent $J-H$ color.

$$\mathcal{D} = (\varpi, J, J-H) \tag{3}$$

We adopt the log likelihood function,

$$\log p\left(\mathcal{D}|\theta\right) \quad = \quad -\frac{1}{2}\left[\frac{(J-J_{model})^2}{\sigma_J^2} + \frac{1}{\sigma_\varpi^2}\left(\varpi - \frac{1}{d}\right)^2 + \frac{\left([J-H]-[J-H]_{model}\right)^2}{\sigma_J^2+\sigma_H^2}\right] \tag{4}$$