Re: methodology/chapter 2 edits

Maurizio Salaris <M.Salaris@ljmu.ac.uk>

Tue 01/10/2019 10:22

To:Lisboa-Wright, Alexander <A.LisboaWright@2017.ljmu.ac.uk>; Bastian, Nathan <N.J.Bastian@ljmu.ac.uk>;

Hi Alex,

a few points.

i) I hope you are working now on improving your description of the fitting functions in the next chapter.

ii) The edits are not really requests. I can just suggest you improvements to try and satisfy the examiners, but at the end of the day the final decision and the way you
write the thesis is yours. You are responsible for the thesis, and in principle I can leave everything to you, because you can submit it without my approval.

iii) Regarding the revised version. I just give you some additional pointers, then it is up to you.
As I always said, pay attention to the wording, use the appropriate terms.

- At the beginning of section 2.1.1 you write

'The first step in this transformation is to formulate theoretical stellar spectra'

What does 'formulate' ,mean here? I suppose you mean 'to compute theoretical stellar spectra', or even better, spectral energy distributions (SEDs).

- In section 2.1 you imply that not measuring the bolometric fluxes is a limitation. Are you sure?
A bolometric flux does not tell you anything about the colour (hence Teff) of a star. You need magnitudes in filters and magnitude differences to calculate colours, hence
have a measure of stellar effective temperatures. And only thanks to observed colours you can estimate the effect of extinction, for example. You can look at the introduction of this review for guidelines

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=11&ved=2ahUKEwiuhurE3PrkAhW1lFwKHY_bDX0QFjAKegQIAxAC&url=http%3A%2F%2Fwww.astro.caltech.edu%2F~george%2Fay122%2FBessel2005ARAA43p293.pdf&usg=AOvVaw0Qba5v9vg1XRyPTFwAGTa0

- at page 21 you write

After this had been completed for all stars in an isochrone...'

the correct word is 'for all points along an isochrone'

- The steps in section 2.6

Step 4 has to come before determining the age, because the age you determine will depend on the metallicity you employ (isochrones TO magnitudes at a given age do depend on the metallicity)

On 25/09/2019 21:43, Lisboa-Wright, Alexander wrote:

> Ok, here are the requested edits.
>
> Cheers,

Alex

From: Maurizio Salaris <M.Salaris@ljmu.ac.uk>
Sent: 23 September 2019 15:49:15
To: Lisboa-Wright, Alexander; Bastian, Nathan
Subject: Re: methodology/chapter 2 edits

Hi Alex,

here are the main comment. Please re-read everything being careful about the logic of your exposition.

i) You write:

Figure 1.2 shows that the difference between absolute monochromatic stellar fux for different effective temperatures itself varies significantly as a function of wavelength. Therefore, when the distance to a star is unknown, a simple photometric flux measurement alone cannot easily distinguish the effect on the flux due to the intrinsic nature of the star from effects due to distance or extinction. This observational problem must therefore be mitigated before an accurate value of the extinction can be determined. The mitigation is carried out by calculating bolometric corrections.

What is the purpose of this paragraph? It seems you are talking about Teff. But then why are you mentioning the distance? It has nothing to do with colours as diagnostics of teff

Then you say you need to know extinction... not clear to do what... then you say you need to calculate bolometric corrections I suppose to calculate extinctions.

All of this I'm afraid is obscure for a general reader. What are you trying to say?

ii) Please, do not start from bolometric corrections in your discussion about teh calculation of Ax/Av. I said this even in the last e-mail. if you want to discuss how extinction affects stars of different teff and log (g), you need to start with your equation 2.1. A difference between m_x given by Eq. 2.1 with A-lambda equal to a generic value minus the case of A_lambda=0. will give you the extinction in the photometric band X corresponding to your chosen A_lambda (and A_lambda is a function of A_V in the interstellar extinction curve).

But you want to explore how AX/AV varies along isochrones, because you wish to assess the effect on isochrone fitting. Therefore you need to start from the bolometric luminosity given by the isochrones. This is the logical sequence. So, link Mbol to Mx and then introduce the

bolometric corrections, showing at this point that you can determine your sought Ax/Av ratios from the calculation of the bolometric corrections.

You need bolometric corrections because you want to determine the variation of Ax/Av along a theoretical isochrone. This is the crucial point to make clear in the thesis

iii) When you mentioned isochrones, remind the reader that you will use them to assess the effect of variable extinction ratios on CMD fitting

iv) Remind the reader why you need stellar model atmospheres

v) isochrone data fitting should be Isochrone CMD fitting

vi) What is (A X /A V) plat in Sect. 2.5?

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