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On the effect of rotation on populations of classical Cepheids

II. Pulsation analysis for metallicities 0.014, 0.006, and 0.002 (*Corrigendum*)

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Figure 17 of Anderson et al. (2016) contained an unfortunate plotting error. The `python` script used to create the plot showing flux-weighted gravity (FWG) values contained a typo (a missing asterisk), leading us to plot $\log(g/(T_{\rm eff,4}\cdot 4))$ instead of the correct $\log(g/T^4_{\rm eff,4})$ for empirical values based on spectroscopic observations. The theoretical predictions were shown correctly. The devious typo led to a spurious disagreement between the predicted and empirically determined FWG-period relations at long periods.

Figure 1 shows the corrected version of our previous Fig. 17. We additionally improved the figure by plotting mean values for FWG determined by a sinusoidal fit to the FWG time series instead of the previously shown, and cruder, center values of FWG determined using the range of $T_{\rm eff}$ and $\log g$. The error bars shown now represent the amplitude of the fitted sine function.

As discussed in Anderson et al. (2016), $g/T^4_{\rm eff,4} \propto M/L$, that is, the flux-weighted gravity directly tests the mass-luminosity relation (Meynet et al. 2015). The corrected Fig. 1 thus demonstrates that the Cepheid mass-luminosity relation predicted by Solar-metallicity Geneva stellar evolution models (Ekström et al. 2012; Georgy et al. 2013) successfully passes the empirical test provided by the spectroscopic flux-weighted gravity of Milky Way Cepheids.

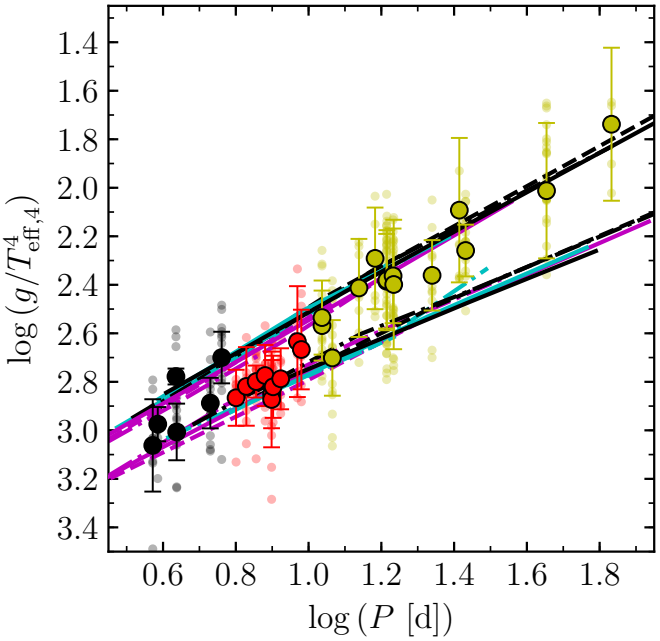

Fig. 1. Flux-weighted gravity-period relation of fundamental mode classical Cepheids. Solar metallicity predictions (Z = 0.014) are shown using different line styles (dash-dotted, solid, and dashed) for different initial rotation rates (non-rotating, average, fast), while crossing numbers (first, second, and third) are distinguished using color (magenta, cyan, and black). Empirical values based on spectroscopic observations of Milky Way Cepheids by Luck & Andrievsky (2004), Andrievsky et al. (2005), and Kovtyukh et al. (2005) are shown as circles. FWG time-series data are drawn as transparent circles. Solid circles show the average of sinusoidal fits to the time-series data, with error bars indicating the amplitude of the fitted sine function.

References

Anderson, R. I., Saio, H., Ekström, S., Georgy, C., & Meynet, G. 2016, A&A, 591, A8
Andrievsky, S. M., Luck, R. E., & Kovtyukh, V. V. 2005, AJ, 130, 1880
Ekström, S., Georgy, C., Eggenberger, P., et al. 2012, A&A, 537, A146
Georgy, C., Ekström, S., Granada, A., et al. 2013, A&A, 553, A24
Kovtyukh, V. V., Andrievsky, S. M., Belik, S. I., & Luck, R. E. 2005, AJ, 129, 433
Luck, R. E., & Andrievsky, S. M. 2004, AJ, 128, 343
Meynet, G., Kudritzki, R.-P., & Georgy, C. 2015, A&A, 581, A36

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