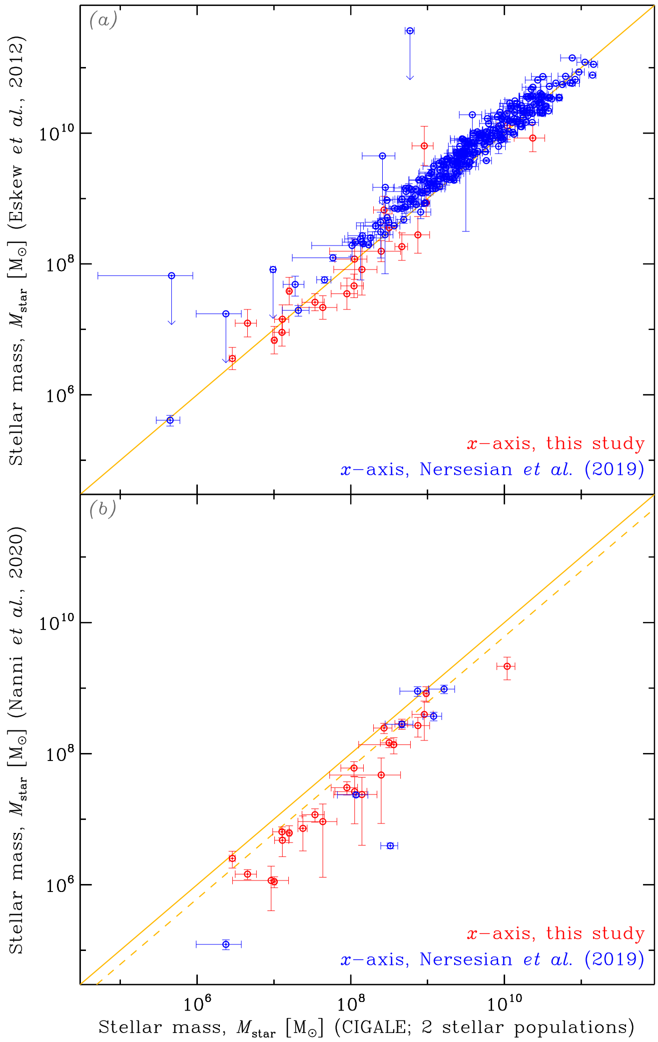

Fig. B.2. Comparison of stellar mass estimators. *Panel a*: compares the `CIGALE` estimates of $M_\star$, using two stellar populations (x-axis), with the Eskew et al. (2012, y-axis) empirical approximation, both assuming a Salpeter (1955) IMF. *Panel b*: compares the same x-axis as *panel a* to the `CIGALE` estimates, using a single stellar population and a Chabrier (2003) IMF, by N20. In both panels, the blue symbols correspond to the values presented in Nersesian et al. (2019), and the red symbols correspond to the values estimated for this study, with the same `CIGALE` settings. The solid yellow line represents the 1:1 relation. The dashed yellow line in *panel b* represents the 1:0.61 relation that accounts for the difference in IMFs.

Appendix C: Additional discussion on the parametrization of THEMIS

We have presented the way we parametrize the `THEMIS` size distribution in Sect. 3.1.1. It consists in linearly scaling the fractions of a-C(:H) smaller than 7 Å, and between 7 and 15 Å. We call it the linear parametrization. It is controlled by the two parameters $q_{\rm AF}$ and $f_{\rm VSAC}$, introduced in Sect. 3.1.1. In the present appendix, we demonstrate, on an example, that this parametrization is flexible enough to mimic the original parametrization of `THEMIS`. The `THEMIS` size distribution of small a-C(:H) is a power-law, with minimum cut-off size $a_{\rm min} = 4$ Å and index $\alpha = 5$ (Table 2 of Jones et al. 2013). We call it the nonlinear parametrization. Varying $a_{\rm min}$ and α is probably more physical than our linear method, as it preserves the continuity of the size distribution. However, it produces SEDs with very similar shapes.

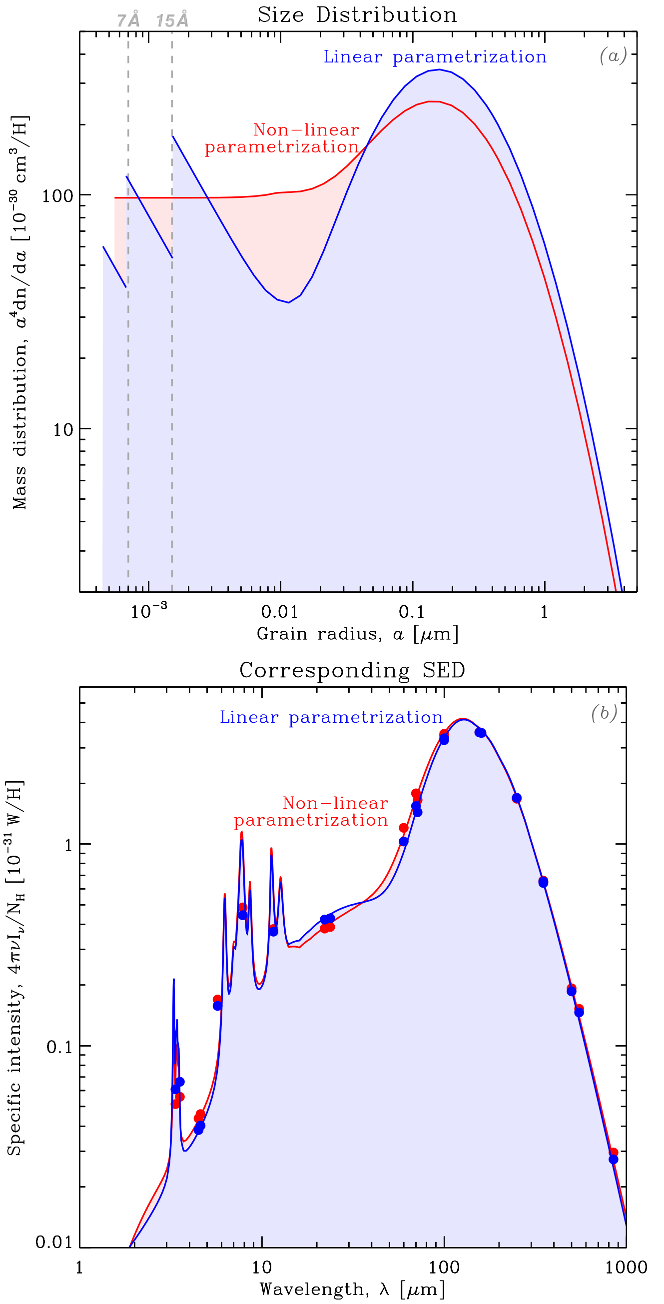

Fig. C.1. `THEMIS` parametrization comparison. The two panels display the same quantities as Fig. 1. On each panel, the red curve shows `THEMIS`, nonlinearly parametrized, that is varying the minimum cut-off radius, $a_{\rm min}$, and the index of the power-law1 size distribution, α. The blue curve shows `THEMIS`, linearly parametrized, with the method described in Sect. 3.1.1. The dots on the two SED curves (*panel b*) represent the synthetic photometry, that is the model integrated in the filters of Table 1.

This is demonstrated on Fig. C.1. This figure displays the same quantities as Fig. 1, but compares the two parametrizations. The red curves show the size distribution (panel a) and the corresponding SED (panel b), for the nonlinear method, with $a_{\rm min} = 5$ Å and $\alpha = 4$. The blue curves show the same quantities, with the linear method. We see that the broadband fluxes (dots in panel b) produced by these two parametrizations are very similar. The fact that they are not exactly the same is not important here. What is relevant is that the two methods can alter the SED with the same dynamical range.