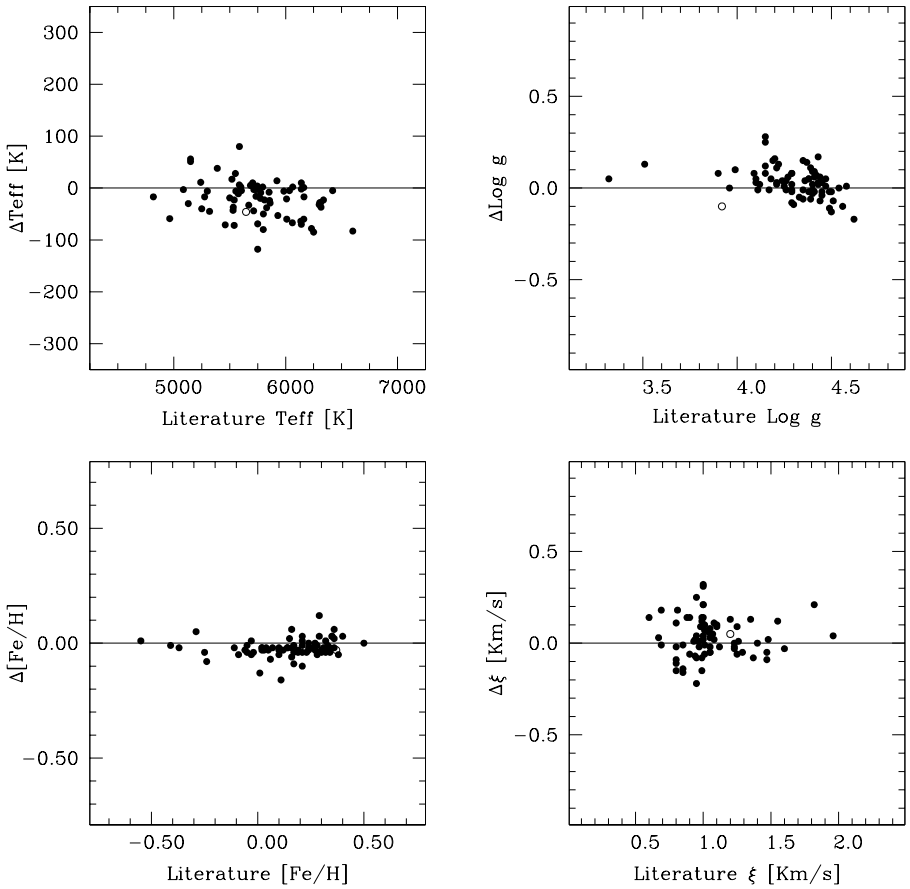

Fig. 3. Difference between FUNDPAR parameters and literature (y axis) vs. literature (x axis). The panels shows separately the effective temperature, gravity, metallicity and ξ. Filled and empty points correspond to solutions with $\chi^2 < 1$ and $\chi^2 > 1$, respectively.

vection (mixing-lenght parameter=1.25), overshooting (W=1) and damping in the Unsöld approximation, but multiplied by a factor as suggested by Blackwell, Lynas-Gray, & Smith (1995). The use of the fourth condition within the function χ^2 is (possibly) another difference from previous studies. Literature works surely take this into account, but it is not totally clear for us how they do so. Finally, we use the MOOG 2009 version[7] of the program instead of the 2002 version used in the literature, although we expect almost the same abundance values from both versions.

These differences, at least in part, produce the slightly dissimilar values showed in the Figure 3, which suggest that FUNDPAR probably uses a different metallicity scale than that of the literature. A complete comparison requires the exact knowledge of all involved details used in the literature calculations. Our intention is to clearly present all the asumptions used in FUNDPAR, in the model atmospheres and within the code.

In Figure 4 we show the histogram distributions of the uncertainties derived for $T_{\rm eff}$, $\log g$, [Fe/H] and ξ. The densely and slightly shaded histograms correspond to uncertaities derived following Gonzalez & Vanture (1998) and using the χ^2 function, respectively. Some distributions present a peak in a common uncertainty value, such as ∼0.05 dex in the [Fe/H] distribution and ∼30 K in the distribution of effective temperature. We see that the errors derived using both methods are comparable.

The metallicities presented in Table 4 correspond to a group of exoplanet host stars. The median of the group is 0.17 dex with a dispersion of 0.22 dex. In Figure 5 we present the histogram of the metallicity distribution. Then, as an example of the practical use of FUNDPAR, we verified the metal-rich nature of main sequence stars with low mass companions,

[7] `http://verdi.as.utexas.edu/moog.html`.