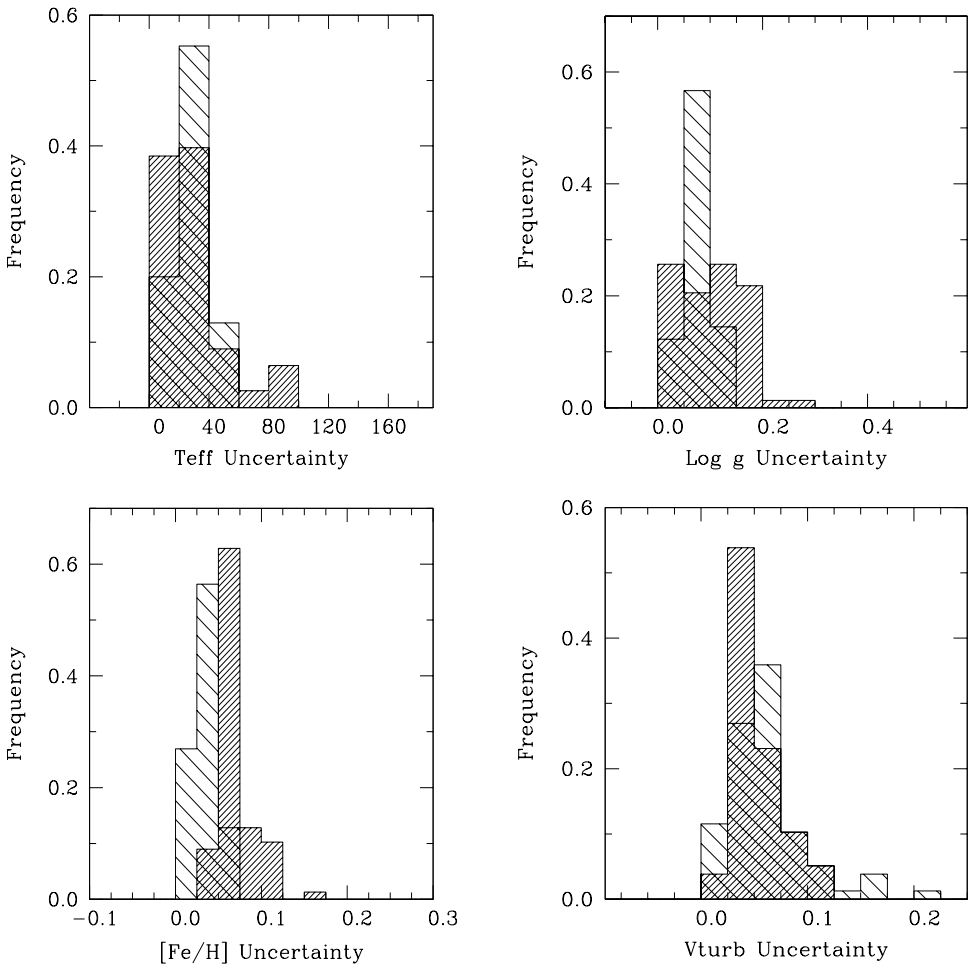

Fig. 4. Histogram distributions of the uncertainties in $T_{\rm eff}$, $\log g$, [Fe/H] and ξ derived with FUNDPAR. The densely and slightly shaded histograms correspond to uncertaities derived following Gonzalez & Vanture (1998) and using the χ^2 function, respectively.

a fact known from the literature (see, for example, Gonzalez 1997; Santos et al. 2000).

7. CONCLUDING REMARKS

We have implemented a Fortran algorithm available from the web that estimates fundamental parameters of solar type stars, requiring only the measurement of Fe equivalent widths. The final solution should verify the three conditions of the standard method: [FeI/H]=[FeII/H] (i.e., ionization equilibrium), independence of the metallicity from the excitation potential (i.e., excitation equilibrium) and from the equivalent widths. We also add another condition: the input metallicity used in the model atmosphere should be similar to the resulting metallicity from the equivalent widths. We taken into account these conditions in one variable called χ^2, adopting an expression which includes the weights w_1,...,w_4. FUNDPAR uses Kurucz model atmospheres with the NEWODF opacities (Castelli & Kurucz 2003), solar-scaled abundances from Grevesse & Sauval (1998) and the 2009 version of the MOOG program. Different details could be selected, such as the mixing-lenght parameter, the overshooting and the damping of the lines, for instance. We have planed a new version that includes the option of using the WIDTH9 program instead of MOOG.

The code includes the derivation of the uncertainty in the four parameters following the criteria of Gonzalez & Vanture (1998) and another uncertainty estimation using the χ^2 function. We verified the metal-rich nature of a group of exoplanet host stars. The parameters derived with FUNDPAR are in agreement with previous values in the literature.