



Auxiliary data for CU8 : astrophysical parameters of OBA stars

A. Lobel, Y. Frémat

Royal Observatory of Belgium, Brussels



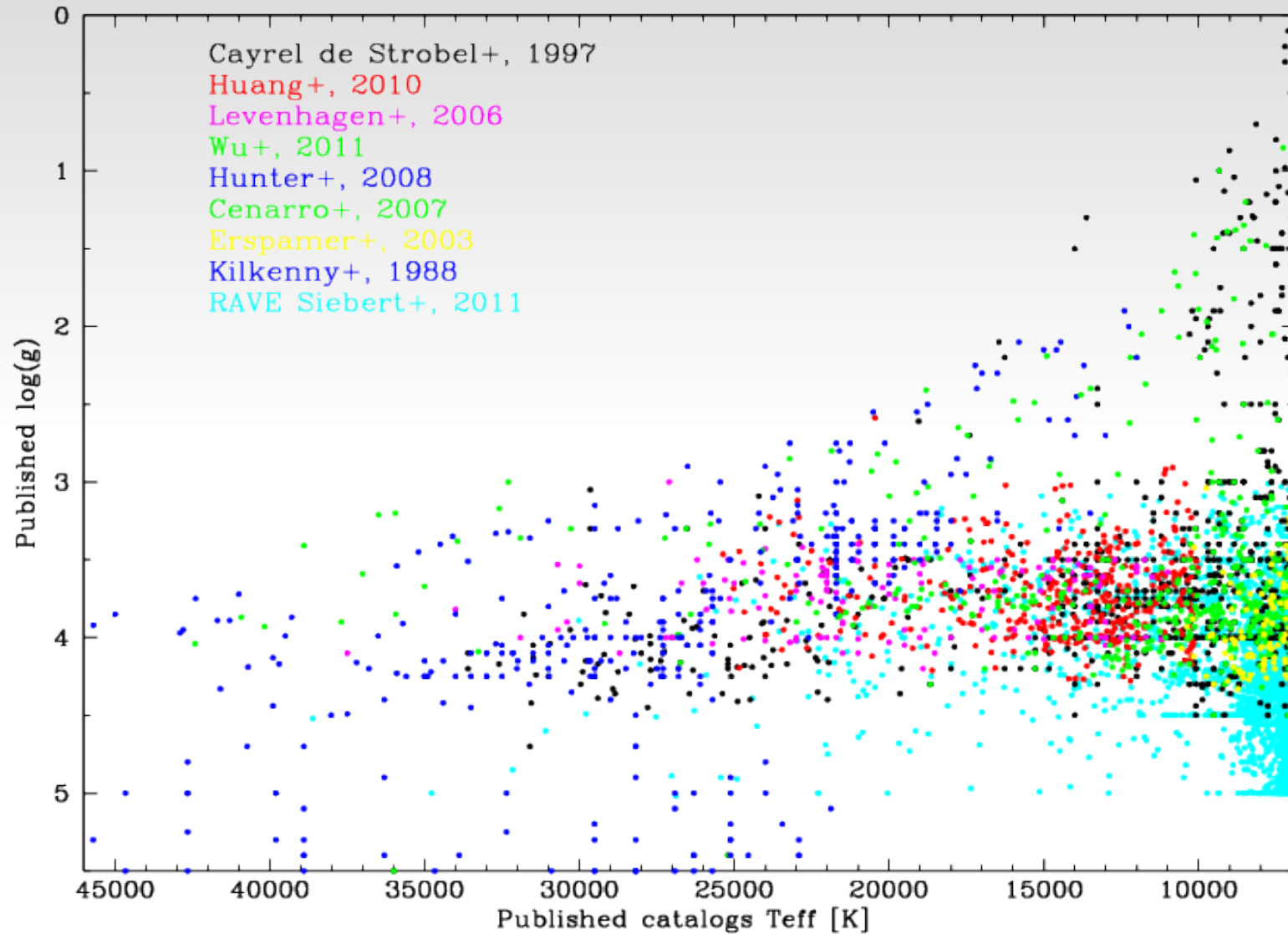
Hot Stars in DPAC-CU8

- Complement ground-based observing programs for collecting spectra of OBA stars with APs provided in the literature obtained with high-res. spectra using model atmospheres ("spectroscopic APs"). Also compute "photometric APs".
- We previously discussed benchmark and reference OBA stars collected in ground-based spectroscopic observing programs in GAIA-C8-TN-ROB-AJL-002-1 "*Data Mining and Processing of Ground-based Observations for Extended Stellar Parametrizer Algorithms: Hot Stars in the Gaia - RVS domain*" of July 2013. 20 benchmark and 600 reference stars including RVS.
- Required for development & training of algos for calibration of APs of hot stars in ESP-HS for upcoming Apsis processing.
- More extensive external hot star catalogs needed for checking Apsis output in CU8. Also useful for CU9 validation of a wide variety of stellar populations.

Auxiliary data for hot stars in CU8

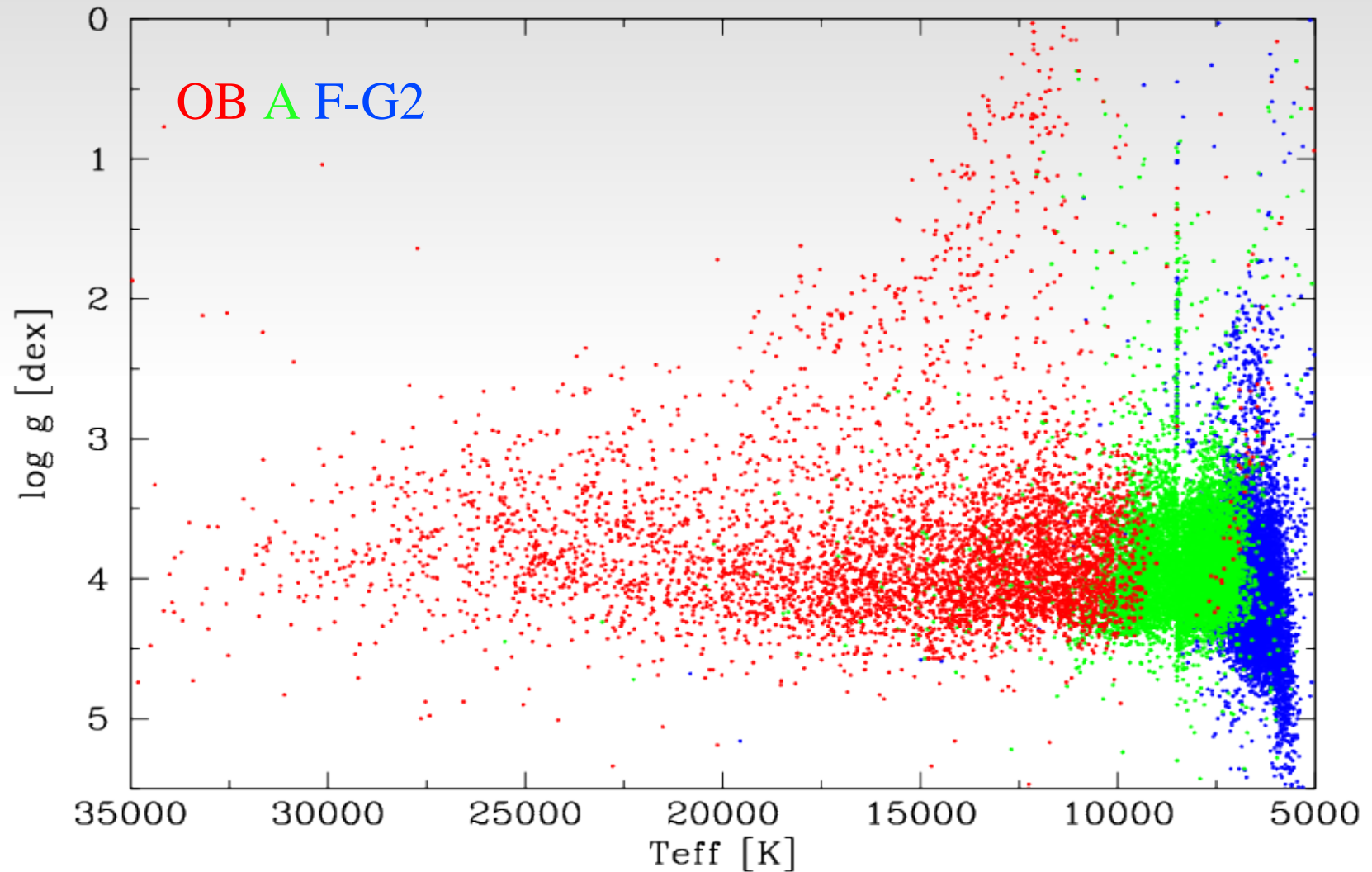
- We collect 18 catalogs of ~4000 stars with $T_{\text{eff}} > 6900$ K from literature with T_{eff} , $\log g$, & $[\text{Fe}/\text{H}]$ if available, including errorbars when provided. 2830 APs of hot stars from RAVE catalog.
- We currently derived APs of ~1000 A & B stars in 2 young open clusters by modeling VLT-Giraffe spectra (iDR2) observed in GES-WG13.
- We compute T_{eff} , $\log g$, and R_* from published Strömgren photometry ("photometric APs") of 7692 A-type stars and 5115 B-type stars with $V < 14^{\text{m}}$. These are incorporated in "*Auxiliary data for CU6 : atmospheric parameters*" (APs for 2M stars) in GAIA-C6-TN-LAB-CS-011-2 by C. Soubiran, Lecampion, & Chemin of Dec 2013.
- We also compute APs of another 13219 F0-G2 stars from Strömgren data. Possibly also useful auxiliary/external data for FGK star analysis in CU8/CU6?

Spectroscopic APs of hot stars

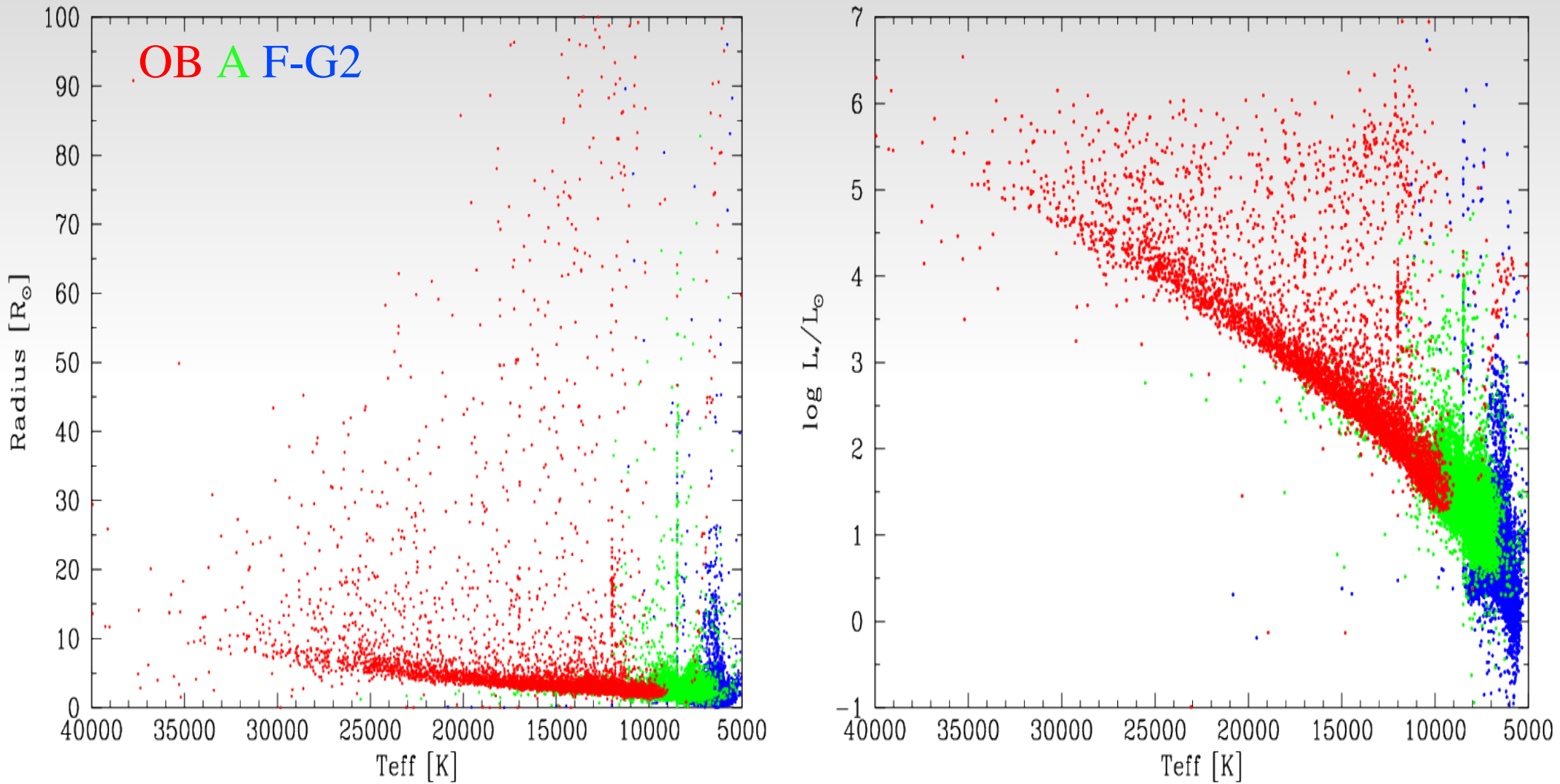


Photometric APs of hot stars

Teff-logg from *uvby* data of 12800 OBA stars (& 13200 F-G2)



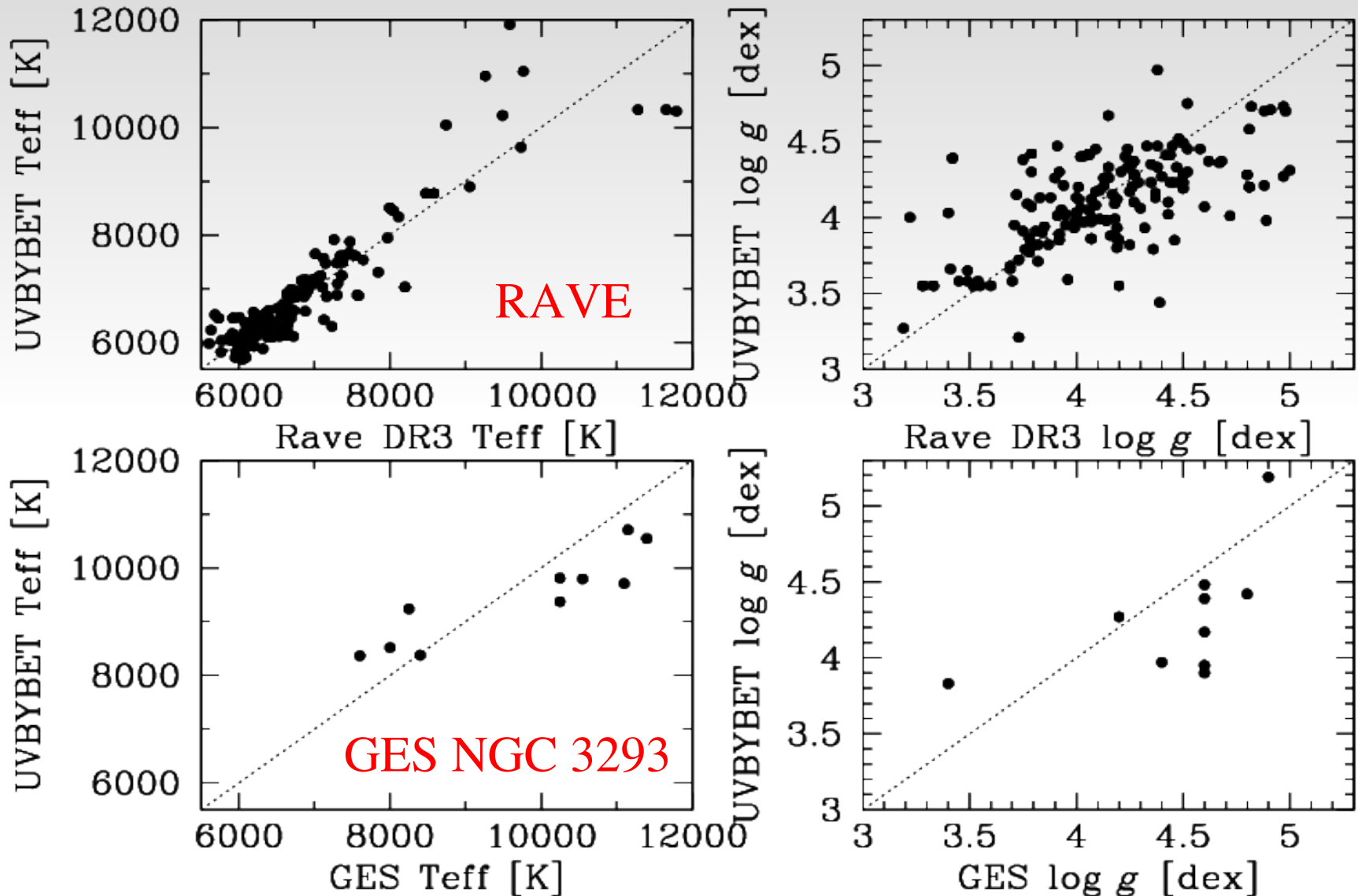
H-R diagram of photometric APs of hot stars



Comparison of spectroscopic and photometric APs

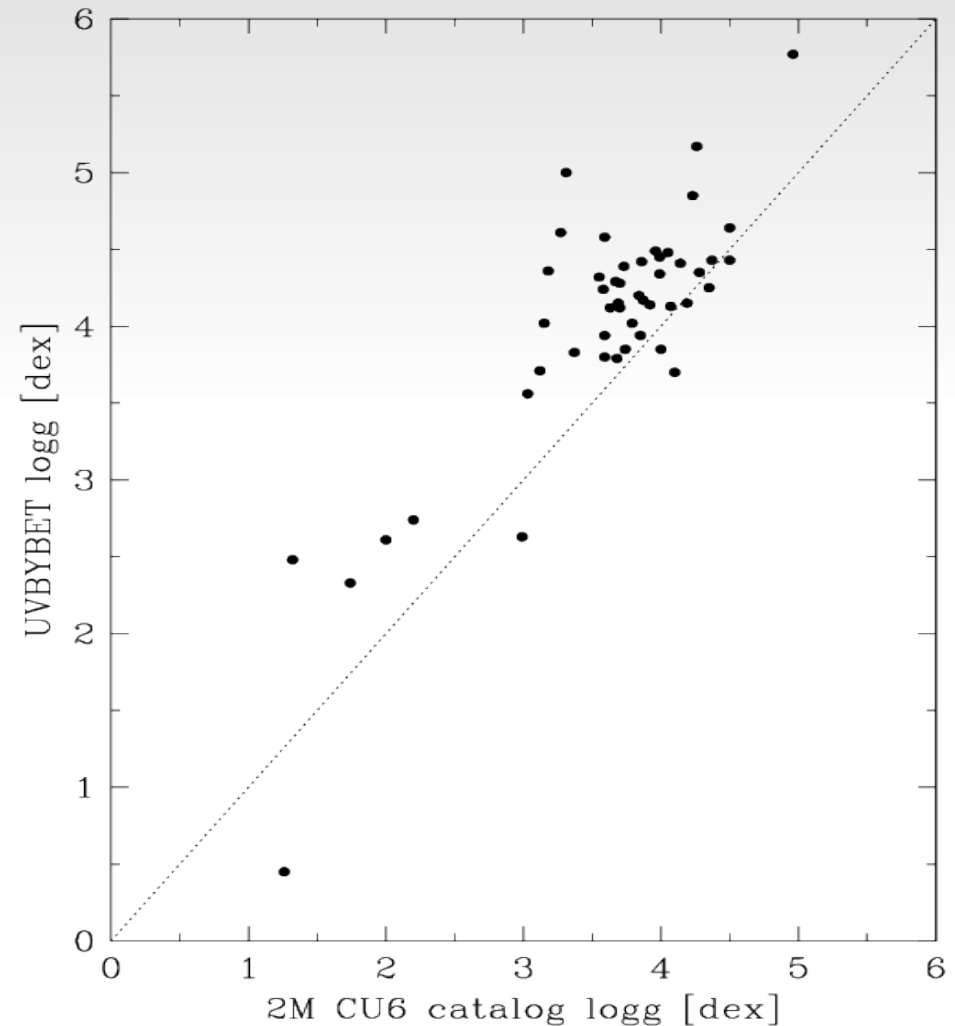
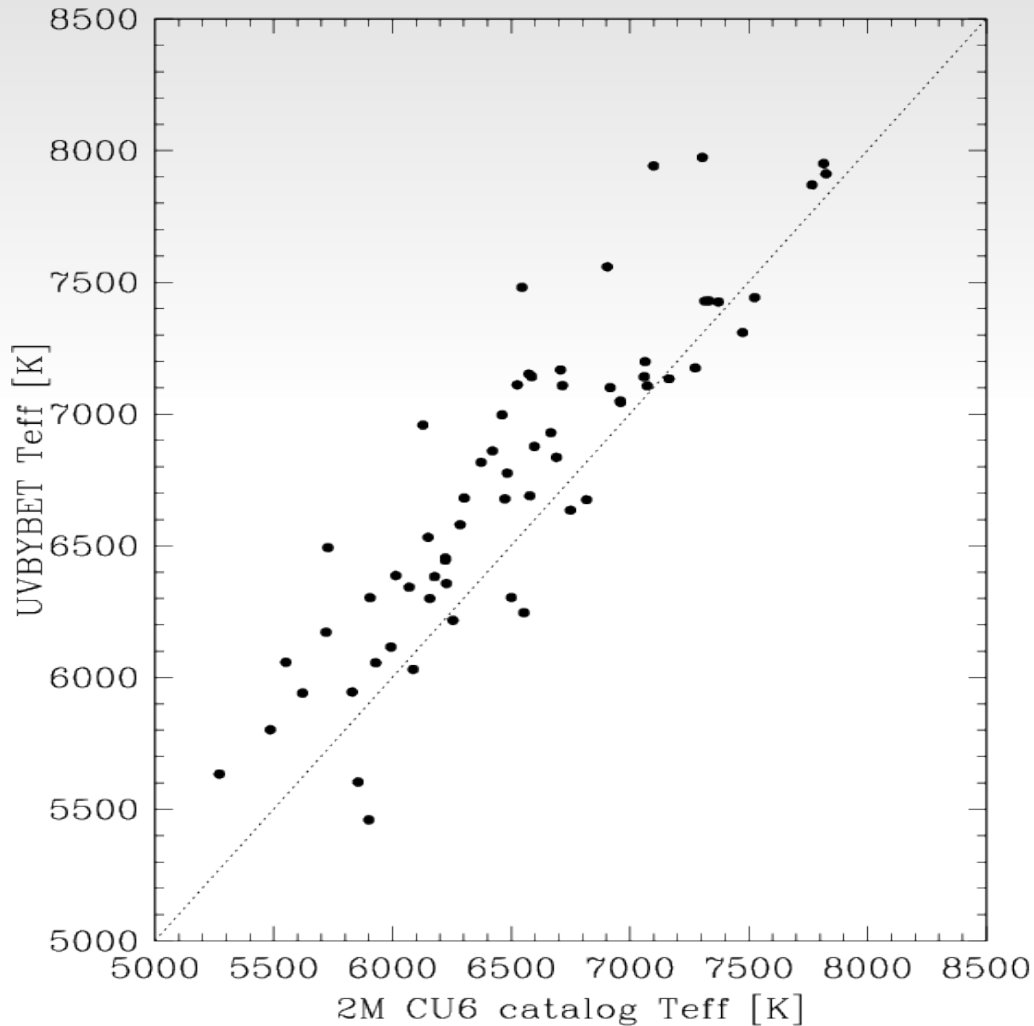
- We crossmatch *uvby* APs with spectroscopic APs provided in RAVE DR3 and stars in NGC 3293 (from GES) for comparing photometric and spectroscopic APs of (~130) hot stars (homogeneous data samples).
- We crossmatch *uvby* APs with spectroscopic APs in 18 hot star catalogs and also those provided in 2M CU6 catalog (~350 stars) (diverse/inhomogeneous data samples).

Cross-matching with A-stars in RAVE and GES

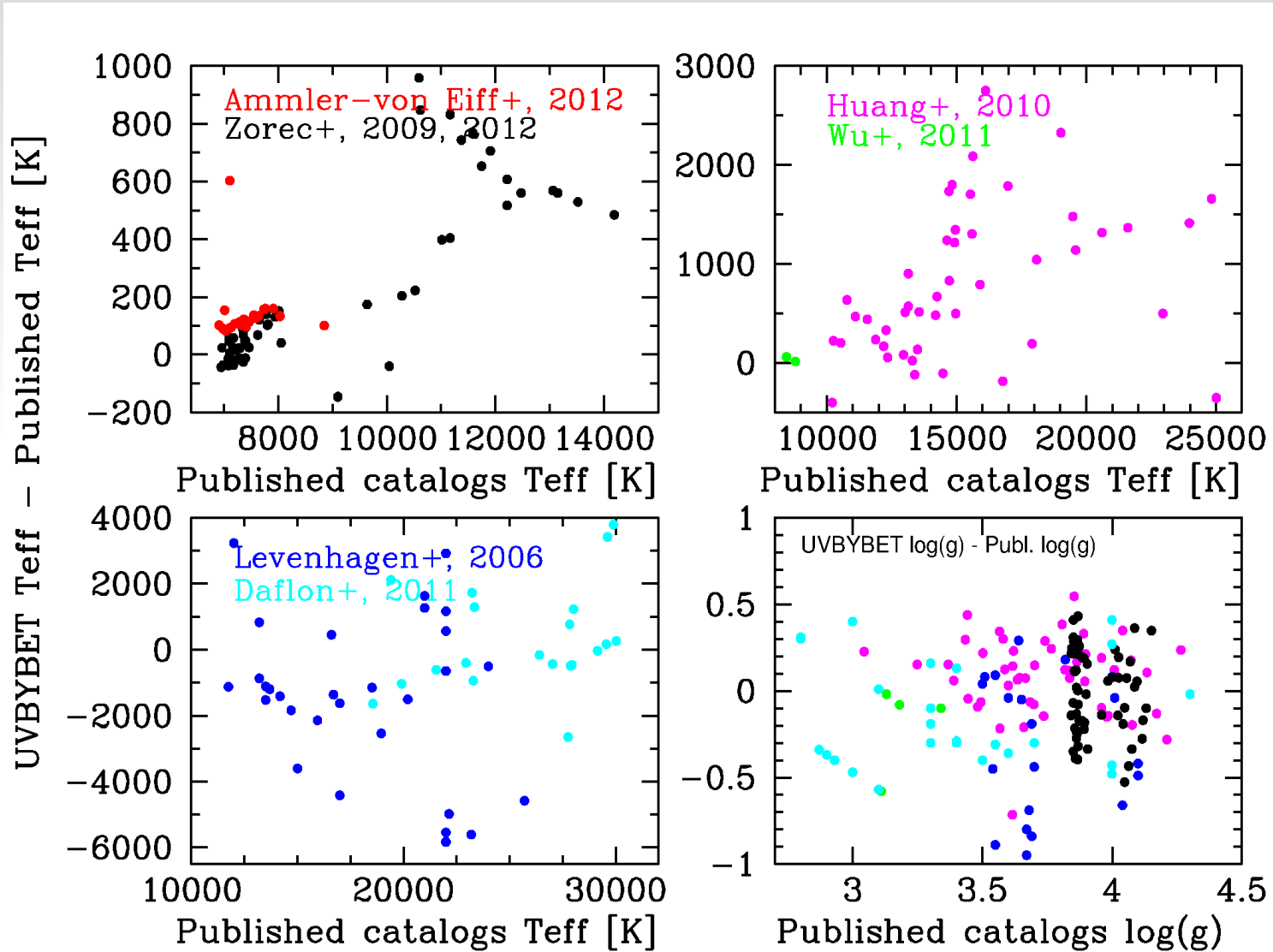


Cross-matching with 2M CU6 catalog

Cross-matching is done using coordinates only since catalog names are 2MASS, HIP, TYC.



Comparison of spectroscopic and photometric APs



Summary

- Compilation of 18 hot star AP catalogs from literature with ~4000 stars.
- Computation of APs of ~12800 hot stars using published *uvby* photometry.
- Cross-matching with RAVE, GES, and 18 hot star catalogs to test quality of photometric APs against spectroscopic APs (~480 stars). Photometric APs are comparable to spectroscopic APs ($7 \text{ kK} < T_{\text{eff}} < 14 \text{ kK}$ $\Delta T_{\text{eff}} \sim 15\%$, $T_{\text{eff}} > 14 \text{ kK}$ $\Delta T_{\text{eff}} \sim 20\%$), but the results clearly depend on type and age of individual catalog as well.
- Main goal is to substantially increase the number of reference hot stars for development & training of ESP-HS, better covering all OBA subtypes.
- Target lists is used for searching more archived spectra, or to submit new spectroscopic observing proposals.
- Cross-match hot stars with APs with EPC and IGSL V3 catalogs.
- Prepare Gaia TN or publish combined with GES results for hot stars.