Gaia Benchmark Stars

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Abstract

The Gaia Benchmark stars (GBS) are reference stars which have been carefully selected for the calibration and the validation of atmospheric parameters massively determined from Gaia data and from spectroscopic surveys. They define the fundamental scale for Teff and logg which are determined independently of spectroscopy, through the fundamental relations based on angular diameters directly measured by interferometry, on bolometric fluxes (Fbol) measured by SED fitting, on parallaxes and masses, all being observable quantities with minor dependencies on theoretical assumptions. GBS are chosen to cover as well as possible the HR diagram in the FGK range, including dwarfs, subgiants, and giants of all metallicities, representative of the different stellar populations of the Milky Way probed by Gaia and other large surveys. After the initial version of 34 stars by Heiter+ 2015, we now present the third version which includes nearly 200 stars. The precision of fundamental (Teff, logg) significantly improved thanks to the exquisite quality of Gaia data reflecting on distances and Fbol. This set of well-characterised stars is also important to improve stellar models and in the context of PLATO for the WP125.

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