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The GALAH Survey: Third Data Release

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ABSTRACT

The GALAH survey has continued observations and data analysis after its second Data Release in April 2018. After this Data Release, the *Gaia* collaboration has also released their second data set with an overlap of XX% with the stars observed by GALAH. The exquisite parallax information delivered with *Gaia* DR2 has allowed the GALAH collaboration to adjust the data analysis for all stars in order to take this astrometric data and photometry from 2MASS into account when optimising the stellar spectroscopic parameters. In this paper we explain the new analysis pipeline in detail and present the validation tests performed for the data published as part of GALAH Data Release 3.

Key words: Surveys – the Galaxy – methods: observational – methods: data analysis – stars: fundamental parameters – stars: abundances

ACKNOWLEDGEMENTS

Based on data acquired through the Australian Astronomical Observatory, under programmes: A/2013B/13 (The GALAH pilot survey); A/2014A/25, A/2015A/19, A2017A/18 (The GALAH survey). We acknowledge the traditional owners of the land on which

We have run SME on the full survey data

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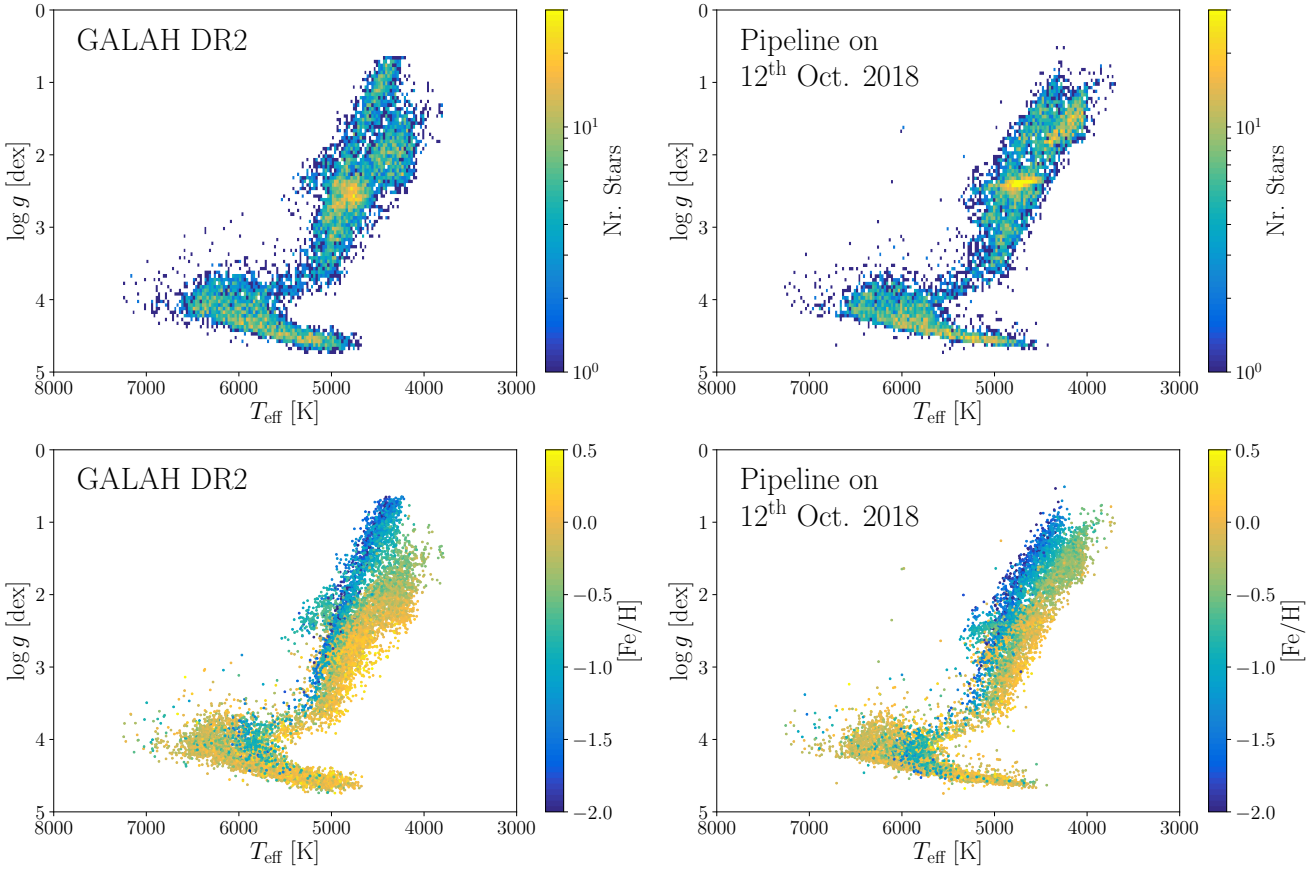

Figure 1. Caption

the AAT stands, the Gamilaraay people, and pay our respects to elders past and present.

The following software and programming languages made this research possible: IRAF (Tody 1986, 1993), CONFIGURE (Miszalski et al. 2006); Python (versions 2.7 & 3.6); Astropy (version 2.0; Astropy Collaboration et al. 2013; The Astropy Collaboration et al. 2018), a community-developed core Python package for Astronomy; pandas (version 0.20.2; Mckinney 2011); TOPCAT (version 4.4; Taylor 2005); GALPY (version 1.3; Bovy 2015). This research made use of APLpy, an open-source plotting package for Python (Robitaille & Bressert 2012). This research has made use of the VizieR catalogue access tool, CDS, Strasbourg, France. The original description of the VizieR service was published in A&AS 143, 23.

This work has made use of data from the European Space Agency (ESA) mission *Gaia* (`http://www.cosmos.esa.int/gaia`), processed by the *Gaia* Data Processing and Analysis Consortium (DPAC, `http://www.cosmos.esa.int/web/gaia/dpac/consortium`). Funding for the DPAC has been provided by national institutions, in particular the institutions participating in the *Gaia* Multilateral Agreement.

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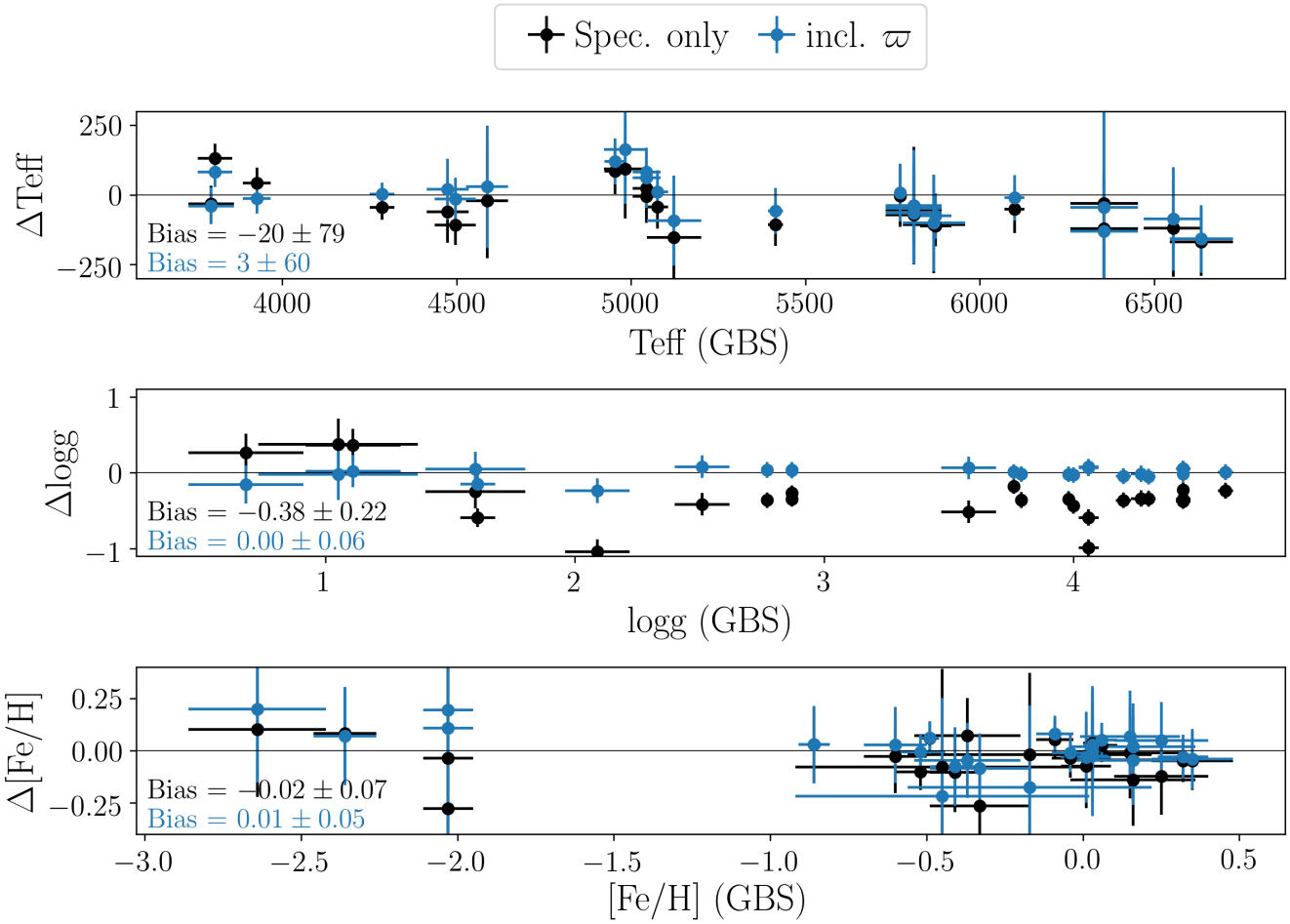

Figure 2. Caption

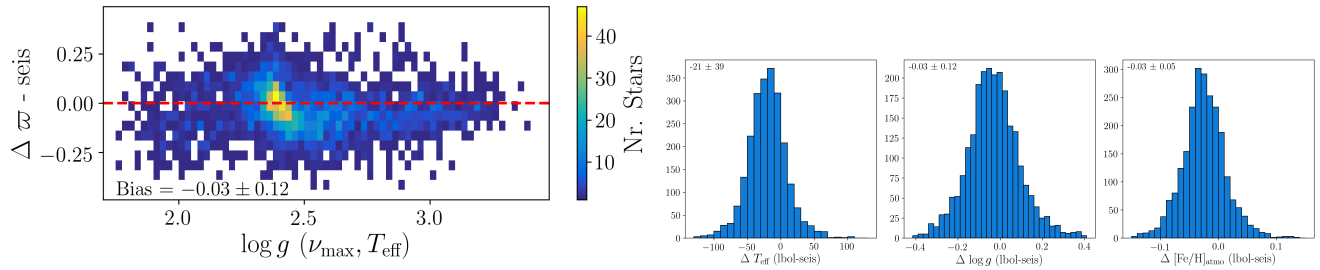

Figure 3. Caption

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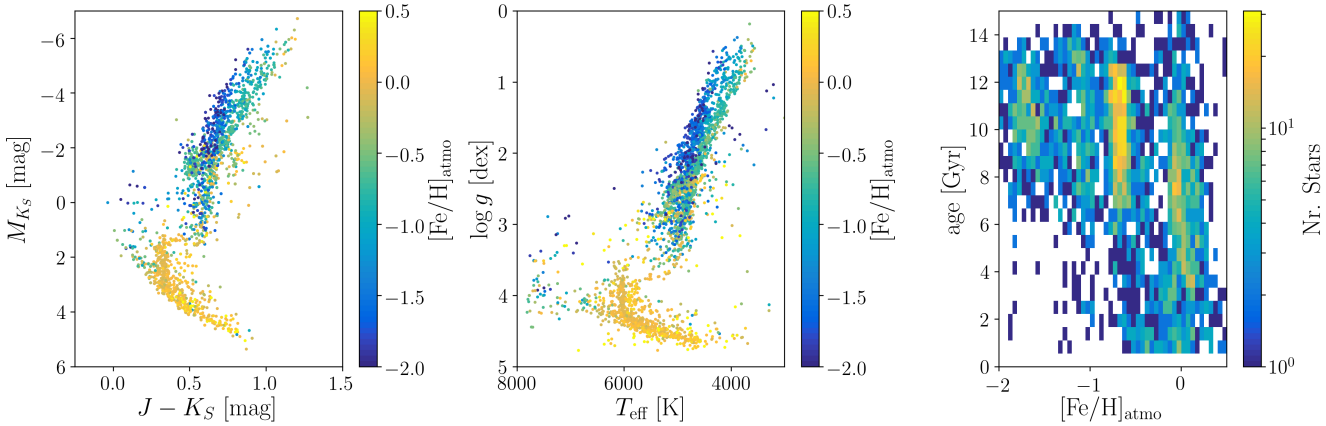

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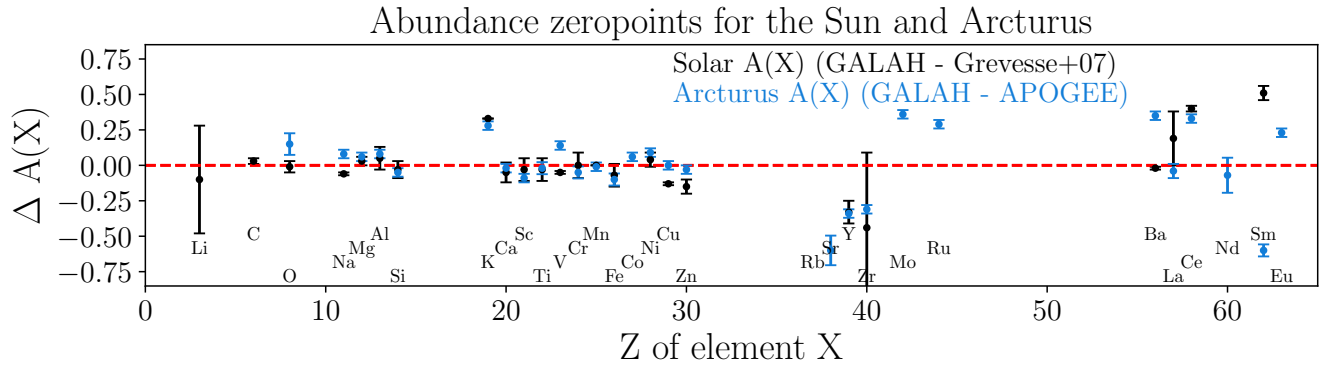

Figure 5. Caption

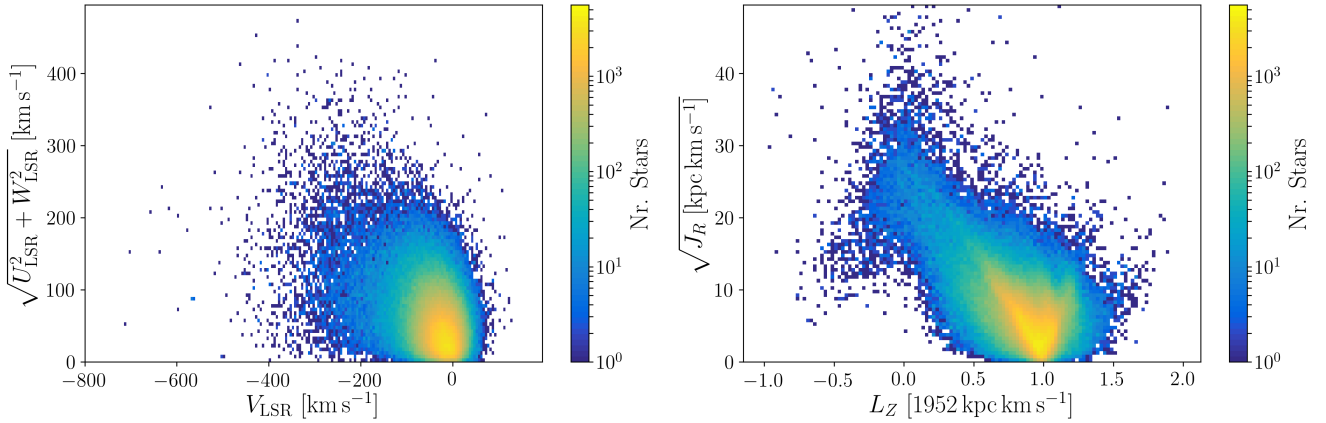

Figure 6. Caption