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Spectroscopic follow-up of RAVE peculiar stars with a 70cm telescope

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Abstract. Polse di Cougnes 70cm telescope and its Multi Mode Spectrograph is used to obtain follow-up far-red spectroscopy of peculiar stars with molecular bands discovered by the RAVE survey. During 2004-2013, RAVE collected medium resolution spectra of ∼500 000 stars of the southern hemisphere, over the same wavelength range of the soon-to-be-launched Gaia satellite.

Key words: Stars: peculiar – Galaxy: kinematics and dynamics

RAVE (RAdial Velocity Experiment) is a digital spectroscopic survey of stars in the magnitude interval $9 \leq I_C \leq 12$, distributed over the whole southern sky at galactic latitudes $|b| \geq 20°$. Spectra are recorded over the 8400−8800 Å range (the same of the soon-to-be-launched Gaia space mission), at a resolving power of 7500, with the UK Schmidt telescope feeding light to a spectrograph via the 6-degree Field (6dF) 150 fiber-positioner. Via the determination of radial velocities, temperatures, gravities, metallicities, α-enhancements and chemistries for a large number of high-latitude stars, the overarching science driver for the survey is the investigation of the structure and evolution of the Milky Way. RAVE has observed ∼500 000 stars, about 10% of them at more than one epoch, and has led to the publication of already more than 40 refereed papers on many topics of Galactic archeology. Kordopatis et al. (2013) provided the latest data release, and Matijevic et al. (2012) listed the peculiar stars discovered by the survey. Extensive atlases of spectra of a great number of template peculiar stars observed over the RAVE/Gaia interval have been published by Munari (2003) and Tomasella et al. (2012). The stars believed to display molecular absorption features in their RAVE spectra, and laying north of declination -25° (we observe from +46° latitude), are the targets for our follow-up, low-resolution spectroscopy with the 70cm GAPC telescope in Polse di Cougnes (Udine, Italy), which is equipped with an early version of the Multi Mode Spectrograph described by Munari and Valisa (these proceedings).

The RAVE and Gaia wavelength range is short and hosts features from only some molecular bands (primarily TiO, VO, CN, ZrO, LaO, CeO). Derivation of atmospheric parameters and chemical abundances for spectra affected by molecular bands is - at best - a tricky business. It seems therefore valuable to obtain, for these stars, spectra over a wider wavelength range that includes also the RAVE/Gaia one. Our follow-up spectra serve two main purposes: (1) to

confirm the results of the highly automated spectral pipeline used by the RAVE consortium (Matijevic et al. 2012) to identify and classify peculiar stars, and (2) to calibrate the spectral features visible in the RAVE/Gaia wavelength range against those better known at shorter wavelengths. We have already obtained a spectrum of about a third of the ∼260 RAVE molecular band stars north of −25° declination, over the 5700−9000 Å interval at 1.1 Å/pix dispersion (and ∼3.5 pix FWHM). For classification purposes we have also obtained similar spectra for a complete set of cool MKK standard stars (O-rich sequence), and for S-type and Carbon standard stars. A parallel program to obtain 3400-7800 Å follow-up spectra of other types of RAVE peculiar stars is being pursued with the Asiago 1.22m + B&C telescope by a team led by A. Siviero and P. Ochner.

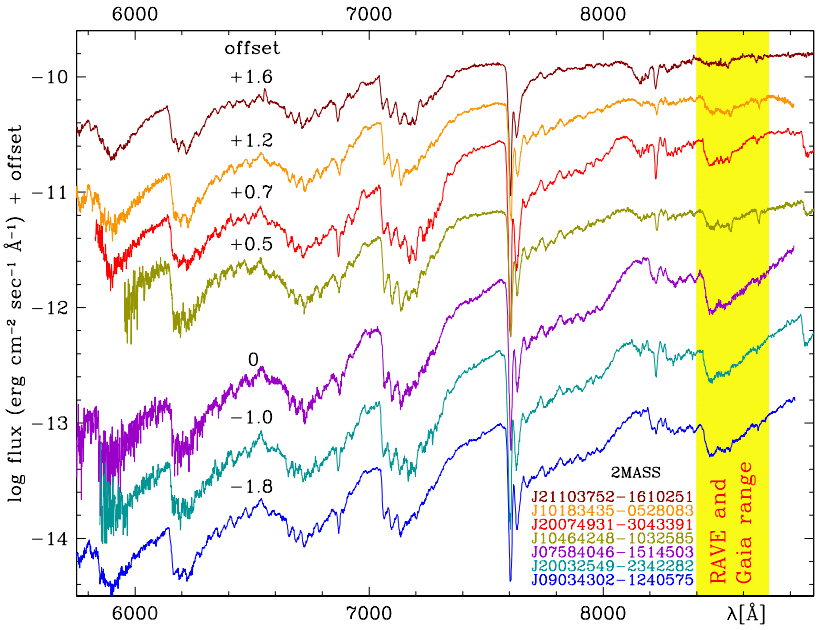

Figure 1. Examples of the spectra of RAVE peculiar stars with molecular bands that we are obtaining with Polse di Cougnes 70cm telescope. The wavelength interval (8400-8800 Å) covered at a higher resolution by RAVE and the Gaia satellite is marked by the yellow strip. The 2MASS identifiers are listed at the bottom.

References

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