Probing the cool ISM in galaxies via 21 cm H I absorption

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Abstract. Recent targeted studies of associated H I absorption in radio galaxies are starting to map out the location, and potential cosmological evolution, of the cold gas in the host galaxies of Active Galactic Nuclei (AGN). The observed 21 cm absorption profiles often show two distinct spectral-line components: narrow, deep lines arising from cold gas in the extended disc of the galaxy, and broad, shallow lines from cold gas close to the AGN (e.g. Morganti *et al.* 2011). Here, we present results from a targeted search for associated H I absorption in the youngest and most recently-triggered radio AGN in the local universe (Allison *et al.* 2012b). So far, by using the recently commissioned Australia Telescope Compact Array Broadband Backend (CABB; Wilson *et al.* 2011), we have detected two new absorbers and one previously-known system. While two of these show both a broad, shallow component and a narrow, deep component (see Fig. 1), one of the new detections has only a single broad, shallow component. Interestingly, the host galaxies of the first two detections are classified as gas-rich spirals, while the latter is an early-type galaxy. These detections were obtained using a spectral-line finding method, based on Bayesian inference, developed for future large-scale absorption surveys (Allison *et al.* 2012a).

Keywords. methods: data analysis — galaxies: active — radio lines: galaxies
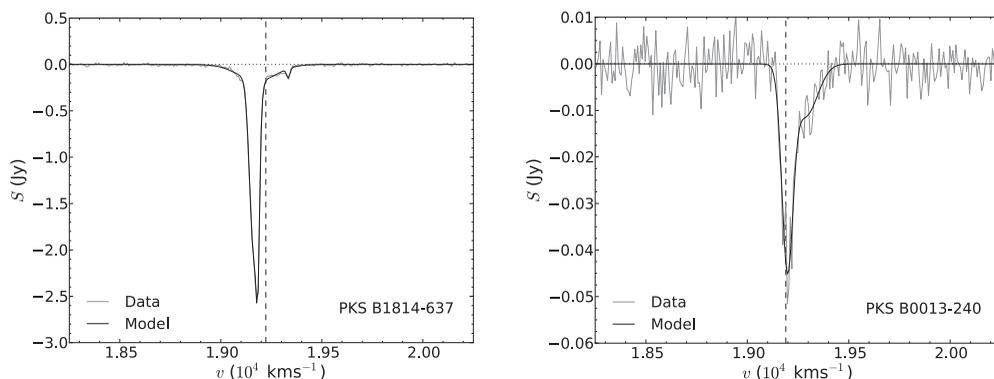
Figure 1. 21 cm absorption in the late-type host galaxies of two compact radio sources.

References

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