LBWG memo 1

The survey test field

Neal Jackson, 2018.05.05

1. Field P205+55 = 1340+55

The main test field for the LBWG is from the Surveys KSP field P205+55, centred at right ascension 13:40:00, declination 55:00:00. It was taken under reasonable ionospheric conditions on 2015 October 15, and observed for 8h with 8 international stations (DE601-UK608). It contains a number of bright LBCS sources, including 1327+5504 at the western edge of the field, which is a relatively compact (5 arcsec) bright double source. Fig. 1 shows the field, with all the sources detected in the main LOTSS survey. There are 1214 objects in all; 12 brighter than 1 Jy, 102 brighter than 100 mJy and 549 brighter than 10 mJy.

The survey observations were taken with 1-s integration and 16 channels per subband. This gives a nominal smearing length for an 800-km baseline of about 1.5–2 degrees in both time and frequency.

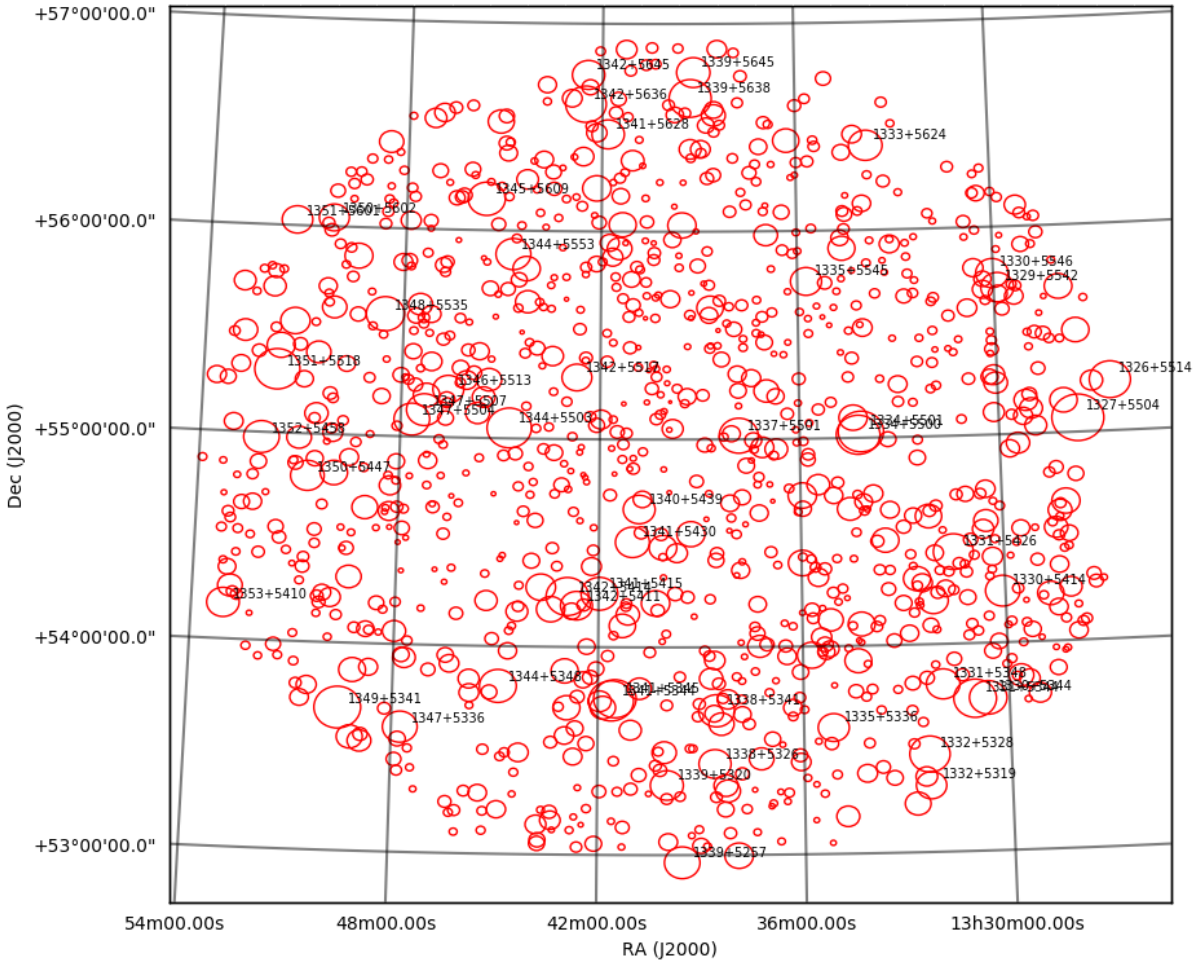

Figure 1: Radio sources in the survey field. Catalogue file `lotss.txt` and plotting software `lotss_plot.py` is available on `https://github.com/nealjackson/lofar-lb`

Fig. 2 shows the LBCS (Moldon et al. 2014, Jackson et al. 2016) calibrators in the field. The field is unusually well supplied with calibrators, with two in the central square degree and a large number of sources with compact structure at greater distances from the field centre.

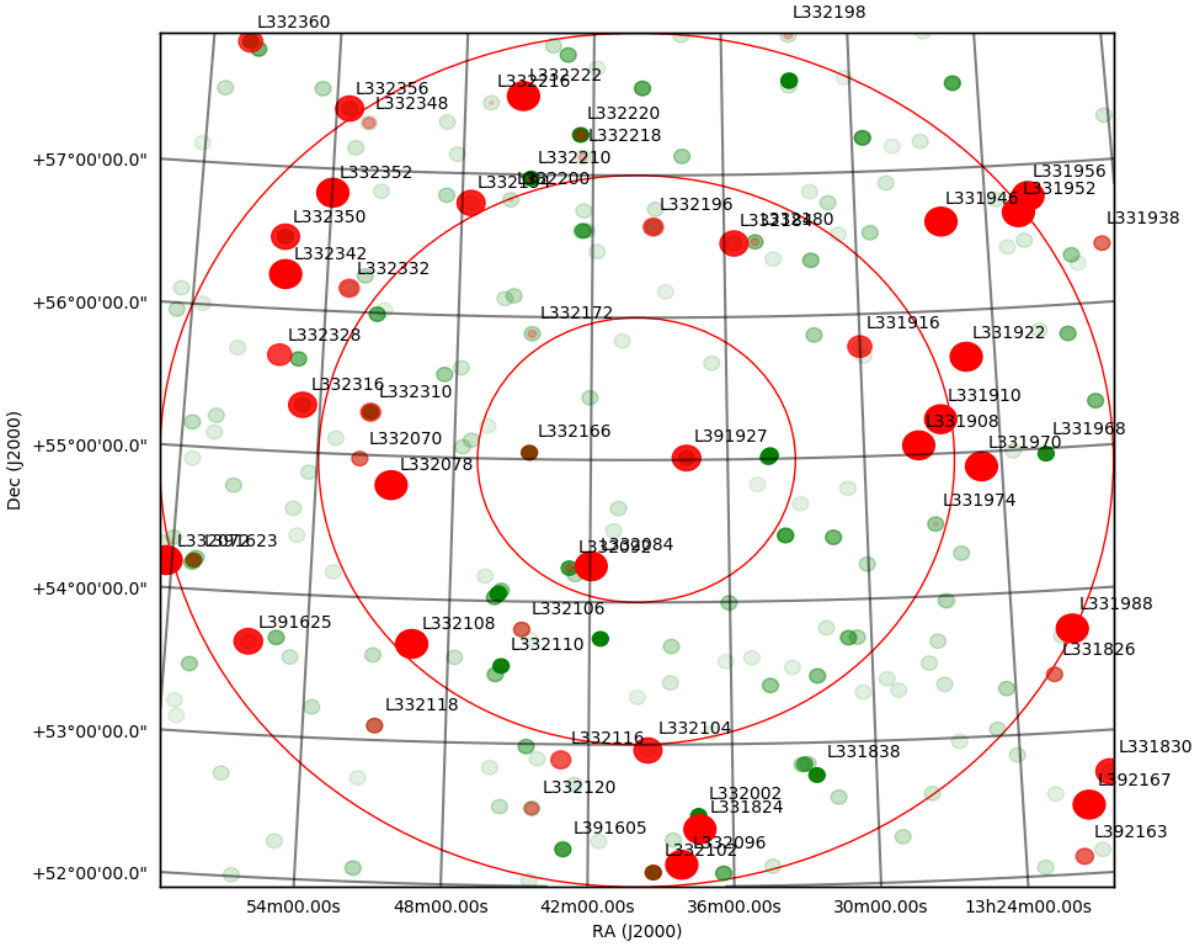

Figure 2: LBCS sources in the survey field. The bright source 1327+5504 is L331908. LBCS sources are plotted larger and redder the more coherence is seen on the longer baselines. WENSS sources are plotted in green, with brighter sources in darker green. Note that a bright WENSS source is not necessarily a good long-baseline calibrator. Plotting software for making these plots for any position, `lbcs_plot.py`, is available on `https://github.com/nealjackson/lofar-lb`; it will also make a file of LBCS calibrators suitable for the LB pipeline scripts.