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SETI searches with the EVN

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The Search for Extra-terrestrial Intelligence (SETI) has recently undergone a major rejuvenation with initiatives like the Breakthrough Listen project, conducting new systematic surveys of the nearest stars and galaxies. These observations focus on the use of the largest single-dish radio telescopes in the world, analysing the raw output voltage data with very fine time and frequency resolution. For arrays such as MeerKAT and the ATA, beam-forming techniques are used to place a few beams on top of specific targets e.g. exoplanets. Employing interferometry techniques for SETI searches on distributed arrays offers some interesting advantages over traditional beam-forming techniques. Some of these advantages are well known, including the strong suppression of RFI signals in cross-correlated data (e.g. Ramparadath et al.). Less well appreciated is that multiple baselines also provide an important level of redundancy that improves the level of confidence in detecting faint signals that may also be one-off, non-repeating, transient events. Another advantage is that modern software correlators permit us to detect signals across the full primary beam of the individual elements of the array, permitting hundreds of known (and unknown) targets to be observed simultaneously using wide-field techniques developed for VLBI. Note that such an approach naturally delivers data with good time and frequency resolution as required for SETI searches. Finally, in the event that a SETI candidate is discovered, radio interferometers distributed on scales of 1000's of km will also be able to pin-point the location of these signals with milliarcsecond precision – this may be crucial in understanding the characteristics of the platform on which the transmitter is fixed, and potentially the nature of the civilisation responsible for generating the signal. We present some of the advantages distributed interferometers can represent, by presenting a short analysis of spectral-line VLBI data drawn from the EVN archive.