RECENT RESULTS FROM THE MWA AND LESSONS LEARNED AT THE FOREFRONT OF EOR PS ANALYSIS EFFORTS

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In the past few years there has been enormous progress in obtaining deep reliable power spectrum measurements from low frequency observations. In this talk I will give an overview of the recent results from the Murchison Widefield Array (MWA) and the calibration and analysis lessons that we have learned. While these techniques have been developed in the context of 21 cm cosmology measurements, many of them are broadly applicable to any precision analysis of interferometric data.

The recent results from the MWA have leveraged both the first and second phases of the telescope's configuration. From 2013–2017 the array consisted of 128 antennas in a centrally condensed pseudo-random configuration that emphasized excellent imaging fidelity and uv coverage. The second phase of the array doubled the number of antennas but kept the same correlator, enabling two new configurations of 128 antennas. The MWA phase II compact configuration includes antennas in regular hexagonal arrangements, while the imaging configuration includes much longer baselines and less central concentration. The compact configuration combines excellent uv coverage with redundant baselines, enabling direct comparison of redundant and sky based calibration for Epoch of Reionization power spectrum measurements.

The analysis of data from these very different configurations has enabled us to make fundamental progress on the precision calibration needed for EoR power spectrum measurements. I will present and contrast the latest measurements and discuss the advances that have led to these results.