## Analysis for H1C IDR 2.2 and 3.1 **Josh Dillon, 12/19/18 From Commissioning Team** 4-pol Raw Data **List of Bad Antennas RTP Antenna Metrics** zen.{JD}.HH.uvh5 bad\_ants/{JD}.txt zen.{JD}.HH.uv.ant\_metrics.json Redcal: redcal\_run.py Cuts times based on solar altitude Finds delays (firstcal) **FirstCal Calibration Solutions** Performs redundant calibration per-time and zen.{JD}.HH.first.calfits per-channel (omnical) Removes antennas with high chi^2 and recalibrates if necessary. **Run FirstCal Metrics:** firstcal\_metrics\_run.py **Omnical Visibility Solutions Omnical Calibration Solutions** Assess FirstCal solutions. zen.{JD}.HH.omni.vis zen.{JD}.HH.omni.calfits FirstCal Metrics *{JD}.HH.first.calfits.firstc* Abscal: al\_metrics.json omni\_abscal\_run.py **Abscal Visibility Model** Use externally calibrated visibilities ??? to solve for Omnical degneracies. **Abscal Calibration Solutions** zen.{JD}.HH.abs.calfits **Cal XRFI** ??? Propose flags based on calibration solutions and chisq **Initial Flags** zen.{JD}.HH.initial\_flags.h5 Single waterfall of flags per polarization (possibly the same for both pols) All other absolute Smoothcal: calibration solutions for smooth\_cal\_run.py the same day. Smooth calibration solutions on a desired calibration and frequency scale. All other Also selections a reference antenna. calibration-based flags for the same day **Smoothed Absolute Calibration Solutions** zen.{JD}.HH.smooth\_abs.calfits **Delay XRFI** Apply initial flags, calibrate, delay filter, subtract CLEAN components from calibrated data, redo XRFI on the difference. Legend **Final Flags** Flagged, Smoothed Absolute zen.{JD}.HH.final\_flags.h5 **Calibration Solutions** Single waterfall of flags per zen.{JD}.HH.final.calfits polarization (possibly the same for **Data with** both pols) **External Origin Autos** Only **Reflection Fitter: Visibility Data** reflections\_fit.py **Product** Use calibrated autocorrelations to that can be multiplied by the final.calfits hera\_cal process **Calibration Solutions of Calibration Data Just Cable Reflections Product** zen.{JD}.HH.reflections.calfits (optional) hera\_qm process **Delay Filter:** delay\_filter\_run.py **Metrics Data** Remove power inside the foreground **Product** wedge with a wide-band delay CLEAN. Analogous Data or Calibrated, Flagged, and **Calibration from Delay-Filtered Residual Data** zen.{JD}.HH.OCRSD.uvh5 **Other Times** (optional) **LST-Binning Pipeline LST-Binning with Foregrounds LST-Binning Delay-Filtered Data** Istbin\_run.py Istbin\_run.py All other data (and calibrations) from Combine together data from different days Combine together data from different days a given group of days to LST-bin at the same LSTs using MAD clipping. at the same LSTs using MAD clipping. Standard Deviation of LST-Binned, **Standard Deviation of LST-Binned LST-Binned Data with Foregrounds LST-Binned, Delay-Filtered Data Data with Foregrounds Delay-Filtered Data** zen.grp{N}.of{M}.LST.{LST in zen.grp{N}.of{M}.LST.{LST in zen.grp{N}.of{M}.STD.{LST in zen.grp{N}.of{M}.STD.{LST in radians}.HH.OCRSL.uvh5 radians}.HH.OCRSDL.uvh5 radians}.HH.OCRSDL.uvh5 radians}.HH.OCRSL.uvh5