SKA Single-Pulse Searches: What do we have?

- Current search processing consists of:

  - dedispersion over range of trial DMs

  - calculating a running mean and RMS

  - selecting all pulses with SNR > x (4-6)

  - remove detected pulses and REPEAT (twice)

  - smooth time series and REPEAT (10 times)

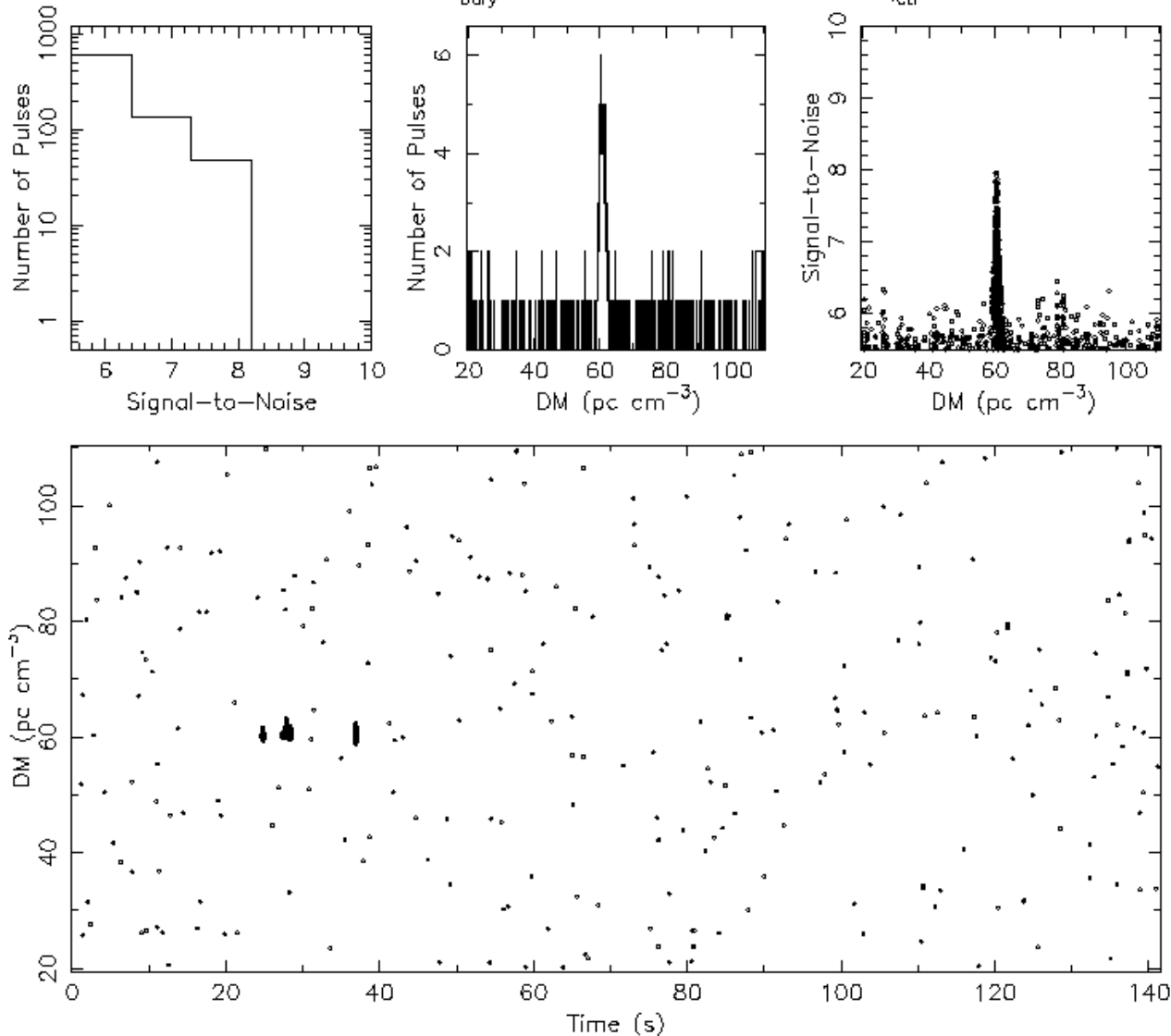 - save all pulses detected and make plot that looks like this….

SKA Single-Pulse Searches: What do we have?

Single pulse results for 'GBT350drift_54288_1625-0846'

SKA PWG Meeting   Maura McLaughlin   July 18

SKA Single-Pulse Searches: What do we have?

- Tweaks to this standard processing include…

  - fitting to expected DM vs SNR shape

  - zapping pulses brightest at 0 DM

  - zapping narrowband signals

  - searching for clusters of points

  - automated calculation of periods through differencing

Good work by Chen Karako at McGill, Laura Spitler at Cornell/MPiFR, and Sarah Burke-Spolaor at Swinburne/JPL.

SKA Single-Pulse Searches: What do we want?

- prompt detection and localization

- well-calibrated polarization

- broad frequency coverage

- automated coincidence testing/RFI rejection

- sufficient frequency resolution for sensitivity to narrow bursts out to high DMs (12,000 pc/cm^3 corresponds to z= 12 or D = 10 Gpc!)

- development of a variety of pulse templates of different width/shape

- development of fast, flexible matched-filter based search algorithms

- ROBUST statistical significance tests