

Commissioning and Testing of SERENDIP VI Instrumentation USNC-URSI National Radio Science Meeting

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SERENDIP VI is the sixth installment of the Berkeley SETI Research Center's Search for Extraterrestrial Radio Emissions from Nearby Developed Intelligent Populations program, which has been ongoing since 1979. Installed on the Arecibo and Green Bank Telescopes in 2014 and 2015, respectively, this latest version of SERENDIP is currently recording approximately 300 signals per minute. Like its younger sibling project, SETI@home, SERENDIP is a commensal program that piggybacks on other users observations, looking for evidence of narrow-band radio emission from extraterrestrial technologies. SERENDIP VI at Arecibo performs high-resolution (1 Hz) channelization of up to seven 300 MHz bandwidth dual-polarization inputs. SERENDIP VI at GBT performs the same analysis over a single 1.5 GHz dual-polarization input.

To monitor and assess the operational status of the SERENDIP VI instrumentation, a readily accessible monitoring system has been devised to provide real-time status updates. To achieve this, a Redis database, receiving data from several diagnostic and metadata sources at Green Bank and Arecibo, has been interfaced with a dynamically generated website using Python and jQuery. Being able to monitor several metrics gathered from SERENDIP VI data and metadata, we are provided with synchronized real-time remote updates on the condition of the instrumentation. A few metrics of interest that the system provides include instantaneous right ascension and declination, Aitoff stereographic projections showing the recent path of the telescopes, and analog-to-digital snapshots of the signals received on all inputs of the SERENDIP VI instruments. Together, these real-time updates allow us to quickly assess irregular instrumentation behavior.

Comparing the real time metadata streaming on the monitoring website with the telescopes' user interfaces utilized by researchers in control of the telescopes, reveals that the streaming data is both accurate and synchronized. Thus far, ADC reports and examination of FITS files suggests the instrument is working well. This monitoring system will continue to monitor SERENDIP VI at Green Bank and Arecibo, and observations of additional diagnostic sources (e.g. distant spacecraft) will be made to further establish the condition and accuracy of the data being recorded in the FITS files.

Here we describe the current status of the SERENDIP VI instruments at both Arecibo and Green Bank, our real time monitoring system, and anticipated scientific outcomes.

