



SSERVI Monthly Report

NESS/PI Burns - June, 2017



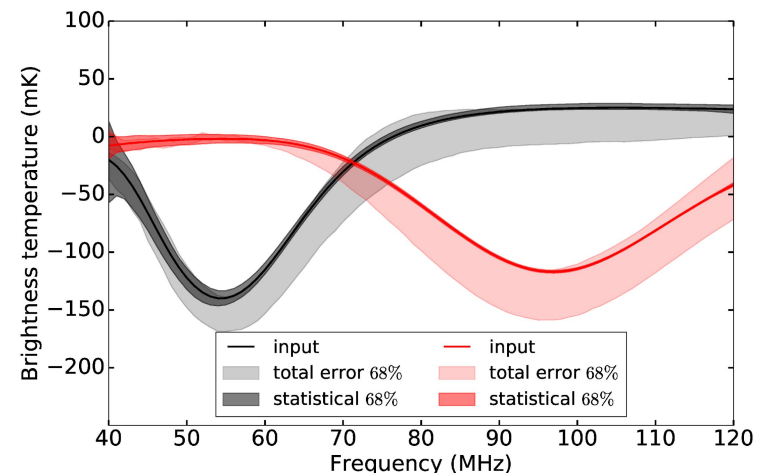
Progress Report

- In Burns et al. 2017, we have shown how the 21-cm spectrum can be measured and astrophysical parameters of the first stars can be constrained in the presence of large foregrounds using a low-frequency radio antenna in lunar orbit.
- Mirocha and Furlanetto are exploring unique signatures from the first generations of stars in the universe that could be observable from a lunar low-frequency radio observatory.
- MacDowall is working on the design of a potential Low-frequency Radio Observatory on the Lunar Surface.
- Papers: Burns et al. (2017), ApJ in press (arXiv: 1704.02651), "A Space-Based Observational Strategy for Characterizing the First Stars and Galaxies Using the Redshifted 21-cm Global Spectrum"; Burns et al. (2017), conference proceedings (arXiv:1705.09692), "Science and Exploration at the Moon and Mars Enabled by Surface Telerobotics"; Mellinkoff et al. (2017), arXiv:1706.03752, "Investigation of minimum frame rate for low-latency planetary surface teleoperations"; Monsalve et al. (2017), submitted to ApJ; Tauscher, Rapetti et al. (2017a, 2017b), in preparation; Mirocha, Furlanetto et al. (2017), in preparation.
- NESS website recently released: <http://www.colorado.edu/ness/>
- Steering Committee (SC) kick-off meeting, May 25, 2017.
- Burns presented invited plenary talk on Space Telerobotics at conference on Bridging the Gap in Space Robotics at MIT on July 15, and invited talk to IAA Symposium on Space Exploration in Torino, Italy on June 28.
- The invited talk in Italy by Burns and the corresponding conference proceedings were co-authored with Kring, who is the PI of the CLSE SSERVI team.

Upcoming Events

- NASA Exploration Science Forum (NESF), July 18-20; 15 talks & posters to be presented by team members.
- NESS Steering Committee meeting at NESF, July 19, 2017.
- Monsalve invited to give seminar at UC Berkeley on July 17 on the status of 21-cm cosmology measurements; and invited to U Richmond to talk about diffuse foregrounds in the context of 21-cm science on July 21.
- Burns will present invited talk on "Lunar Low Frequency Radio Observations" at the U.S. Radio Futures III conference at UC Berkeley on Aug. 3; Bowman will also present invited talk at this conference (Aug 2-4), reviewing the status of global 21-cm experiments.

A Moment of Science



Burns et al. (2017): The extracted 21-cm spectra with 68% confidence intervals for models with primordial Pop II (red) and Pop III (black) stars expected using instrument parameters for a low-frequency radiometer in lunar orbit and 800 hours of observation.