

AN UPDATE ON THE PENN ARRAY RECEIVER.

Simon Dicker<sup>1</sup>, Mark Devlin<sup>1</sup>, Ben Werner<sup>1</sup>  
, Phil Korngut<sup>2</sup>, Brian Mason<sup>2</sup>, Dominic Benford<sup>3</sup>  
, Kent Irwin<sup>4</sup>, Carole Tucker<sup>5</sup>, Peter Ade<sup>5</sup>

<sup>1</sup>University Of Pennsylvania, 209 S. 33rd St, Philadelphia, PA 19147, USA

<sup>2</sup>National Radio Astronomy Observatory, Green Bank, WV 24944, USA

<sup>3</sup>Goddard Space Flight Center, Greenbelt, MD 20771, USA

<sup>4</sup>National Insitute of Standards and Technology, 325 Broadway, Boulder, CO 80303, USA

<sup>5</sup>Cardiff University, 5 The Parade, Cardiff, CF24 3YB, UK

The Penn Array Receiver is a 64 element array designed to work at 90 GHz. It will be deployed on the 100 meter Green Bank Telescope (GBT) in February of 2006. Each array element is a Transition edge sensor (TES) bolometer. No feed horns are used, instead cooled high-density polyethylene lenses and a cold (3 K) Lyot stop control the illumination of the telescope. Capacitive mesh filters act as IR blockers and define a bandpass of 86–94 GHz. The array elements are spaced by  $0.5 f \lambda$  so that the sky is fully sampled in a single pointing of the GBT. This significantly simplifies the scanning patterns needed for sparser arrays. On a telescope the size of the GBT this is a significant advantage.

Each detector is expected to be background limited by the random arrival of photons. The best observing conditions at the GBT are winter nights when we expect to be able to map a 5 arcminute square of sky to  $80 \mu\text{Jy}$  in one hour at a resolution of 8 arcseconds.

The detectors are cooled to 0.25 K using a pulse tube cooler and helium sorption refrigerators. The cryogenics along with all the electronics, and the computer system have been successfully operated on the GBT. By February, detailed tests on the response of the detectors will allow us to further develop the data processing techniques needed to remove atmospheric noise from the data and beam measurements of the cryostat will confirm that the optical design is correct. We are also developing better control software to automatically bias the SQUID multiplexed readout which currently must be set up by hand.

Abstract Submission Form

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1. (a)

Simon Dicker  
David Rittenhouse labs  
209 S. 33rd St  
Philadelphia, PA  
19147 USA  
sdicker@hep.upenn.edu

(b) +1 215 573 7558

(c) +1 215 573 3826

2. J - Radio Astronomy

3. (a)

4. C - Contributed Paper

5. No special instructions