

## Extension of GREAT into a first heterodyne array for far infrared spectroscopy with SOFIA

C. Risacher<sup>1\*</sup>, S. Heyminck<sup>1</sup>, T. Klein<sup>1</sup>, I. Camara<sup>1</sup>, R. Guesten<sup>1</sup>, U. Graf<sup>2</sup>, K. Jakobs<sup>2</sup>, N. Honingh<sup>2</sup>, J. Stutzki<sup>2</sup>, H-W. Hübers<sup>3</sup>, H. Richter<sup>3</sup>, and A. Semenov<sup>1</sup>

*1 Max Planck Institut für Radioastronomie \*, Bonn, Germany, 53212, Germany*

*2 Physikalisches Institut des Universitaet zu Koeln, Köln Germany*

*3 German Aerospace Center (DLR), Berlin, Germany*

\* Contact: [crisache@mpifr.de](mailto:crisache@mpifr.de), phone +49-228-525 338

**Abstract**—The NASA-DLR airborne observatory SOFIA started routine operations in 2011. The current German PI instrument (GREAT) consists of heterodyne receivers observing in selected ranges in the frequency window 1250-2700 GHz. The instrument is built in a modular fashion and allows the parallel operation using two separate cryostats easily interchangeable. The current instruments are single-pixel receivers and are cooled using liquid Helium cryostats. This paper presents two additional new cryostats, which will be cooled using a closed-cycle Pulse Tube coolers, and will consist of small arrays of HEB mixers. The first receiver will observe in the 1.9-2.5 THz range using dual polarization 7-pixel HEB arrays. The local oscillator will be based on photonic mixers. The second receiver will observe the O[II] line at 4.7 THz. The local oscillator will use quantum cascade lasers.

We will present the design, and status of the fabrication of those receivers, which are planned to be installed onboard SOFIA in the coming 2 years.