

Progress on the upGREAT heterodyne array receivers for the SOFIA telescope

C. Risacher^{1*}, R. Güsten¹, J. Stutzki², H-W. Hübers³, A. Bell¹, D. Büchel², I. Camara¹,
R. Castenholz¹, M. Choi¹, U. Graf², S. Heyminck¹, C. E. Honingh², K. Jacobs², M. Justen², B. Klein¹,
T. Klein¹, C. Leinz¹, P. Pütz², N. Reyes¹, H. Richter³, O. Ricken¹, A. Semenov¹, A. Wunsch¹

¹ *Max Planck Institut für Radioastronomie*, Auf dem Hügel 69, 53121 Bonn, Germany,*

² *KOSMA, 1. Physikalisches Institut des Universität zu Köln, Zülpicher Straße 77, 5093 Köln, Germany,*

³ *German Aerospace Center (DLR), Institute of Planetary Research, Rutherfordstr. 2, Berlin, Germany*

** Contact: crisache@mpifr.de, phone +49-228-525 338*

The NASA-DLR airborne observatory SOFIA is about to enter routine observations in 2014, having the German PI instrument (GREAT) as one of its four main instruments. The instrument currently comprises single pixel heterodyne receivers observing in selected ranges in the frequency windows 1.25-2.7 THz. A 4.7 THz single pixel receiver will be commissioned in May 2014.

We present the status of the upGREAT receivers, part of GREAT, which are two medium-size array receivers, operating cooled using closed-cycle pulse tube coolers. The Low Frequency Array (LFA) covers the 1.9-2.5 THz range using dual polarization 7-pixel HEB arrays (hence 14 pixels in total). The second receiver, the High Frequency Array (HFA), will observe the O[*I*] line at ~4.7 THz using a 7-pixel HEB array.

We present here the progress made in the development of those channels. We will show the preliminary results for the LFA for the frequency range 1.9 to 2.1 THz, where we will use a high power VDI solid state chain that can provide LO power for up to 7 pixels. The DSB receiver noise temperatures for the LFA are expected to be below 1000 K DSB for a 0-4 GHz IF range. For the HFA array, results for the NbN HEB Kosma waveguide mixers selected for the HFA [1] show that DSB mixer noise temperatures of 600-1400K will be achievable for the IF range [0-4 GHz] at 4.745 THz.

Installation and commissioning of the LFA instrument is planned for end of 2014, and mid 2015 for the HFA array.