

## Release of GREAT Cycle OC9B/C Calibrated Data Product

From: Jürgen Stutzki (GREAT Principal Investigator)  
To: David Neufeld, General Investigator of Cycle 9 proposal # 08\_0038  
Cc: Randof Klein, Margaret Meixner, Bernhard Schulz  
Date: 27.oct.2021  
Ref.: release of GREAT Cycle 9 data

Dear David –

Please find attached the validated, calibrated GREAT science data that was obtained for your project 08\_0038 during SOFIA's cycle #9 flights in July and August 2021. With this distribution the data will also be ingested into the SOFIA data archive.

Your data have been processed with the latest version of the GREAT calibrator. Spectra are presented on the  $T_A^*$  scale ( $\eta_{mb} = \eta_{for} = 0.97$ , CLASS syntax), and also on  $T_{mb}$  scale with the main beam efficiencies derived from calibration measurements on a suitable planet. Recommended main beam coupling efficiencies are presented in the attached note "overview\_project\_cycle\_09\_OC9BC\_08\_0038.pdf" (pixels have been calibrated individually). The half-power beam widths for the 4GREAT and UPGREAT channels are 55.2" (525 GHz)<sup>1</sup>, 25.7" (1045 GHz), 19.7" (1340 GHz), 14.1" (1.9 THz)<sup>2</sup>, 10.7" (2.5 THz), and 6.3" (4.7 THz)<sup>3</sup>.

The data package (attached as .tar file) does contain

- an overview, providing basic information about your project,
- data product level 3, containing the calibrated spectra in standard CLASS format,
- data product level 4, containing the reduced single-point averaged spectra,
- the \*.class script used in CLASS to process the data,
- a read-me file with details of the data reduction (as appropriate).
- brief logs of the observations.

The Cycle9\_GR\_OT\_08\_0038\_DNeufeld\_Ta.great file contains the science data of your target (identified by source name), but also the receiver (Trec) and system (Tsys) temperatures across the IF band. All spectra have been calibrated for the transmission in the signal band. Should there be a line in the image band that you want to calibrate, make use of the Tcal arrays (provided for both detector bands). Spectra of  $T_{sky} - T_{Hot}$  (observed and modeled) shall enable you to assess the quality of the fit to the atmospheric transmission [see Guan et al. (2012, A&A 542, L4) for details].

If you have questions about the data, the way they were processed or the observations proper, feel free to contact Helmut Wiesemeyer (hwiese@mpifr.de), your GREAT data processing liaison.

Please contact me prior to submitting your first publication based on these data to discuss **appropriate co-authorship** of GREAT team members.

With best wishes,

Jürgen Stutzki (for the GREAT consortium)

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1 Durán et al., IEEE Transactions on Terahertz Science and Technology, vol. 11, issue 2, pp. 194-204

2 Risacher et al. Astron.Astrophys. 595, 34, 2016

3 Risacher et al., Journal of Astronomical Instrumentation, Vol. 7 no. 4, 1840014, 2018