

Release of GREAT Cycle OC9N Calibrated Data Product

From: Jürgen Stutzki (GREAT Principal Investigator)
To: Clark, Christopher, General Investigator of Cycle 9 proposal # 09_0030
Cc: Randolph Klein, Margaret Meixner, Bernhard Schulz
Date: 28 June 2022
Ref.: Release of GREAT Cycle 9 data

Dear Christopher –

Please find attached the validated, calibrated GREAT science data that was obtained for your project 09_0030 during SOFIA's Cycle #9 flights in April 2022. 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_09_0030.pdf" (pixels have been calibrated individually). The half-power beam widths for the UPGREAT channels are 14.1" (1.9 THz)¹ and 6.3" (4.7 THz)².

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

- An overview, providing basic information about your project.
- Data products level 3, containing the calibrated spectra in standard CLASS format.
- Data products level 4, containing the reduced single-point, averaged spectra.
- The *.class scripts used in CLASS to process the data.
- Brief logs of the observations.

The "Cycle9_GR_OT_09_0030_CClark_Tant.great" file contains the science data of your target (identified by source name IC342), but also the receiver (T_{rec}) and system (T_{sys}) 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 T_{cal} 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].

¹ Risacher et al. Astron.Astrophys. 595, 34, 2016

² Risacher et al., Journal of Astronomical Instrumentation, Vol. 7 no. 4, 1840014, 2018

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If you have questions about the data, the way they were processed or the observations proper, feel free to contact Rebeca Aladro (aladro@mpifr-bonn.mpg.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)