



Simulations & Data Challenges: DC0 CHLAT Data Delivery & Measurement Requirements

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Data delivery: NERSC Community File System

Path at NERSC: `/global/cfs/cdirs/cmbs4/dc/dc0/`

Components:

- Primary CMB + dipole
- Lensing perturbation
- Extragalactic Foregrounds + SZ Effects + Galactic Foregrounds
- Atmosphere + Noise

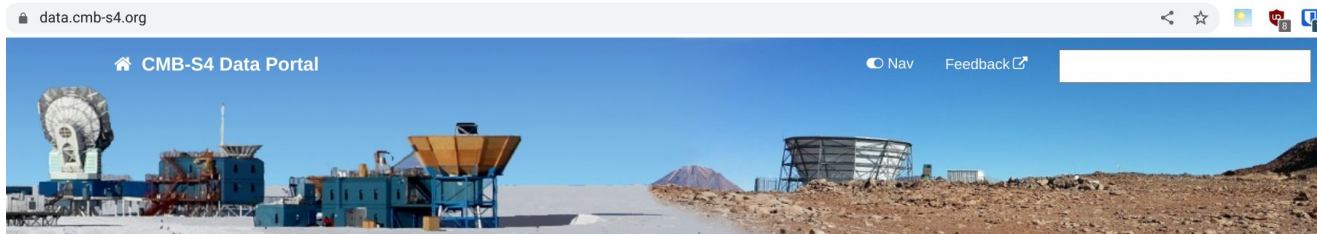
Channels:

- Chile LAT, all frequency bands

Auxiliary files:

- White noise matrix
- Temperature/Polarization depth map

Data delivery: data.cmb-s4.org



- CMB-S4 Data Challenge 0 (DC0) ▲
- Data Challenge 0 Release Page
- DC0 CHLAT Full mission maps 025
- DC0 CHLAT Full mission maps 040
- DC0 CHLAT Full mission maps 090
- DC0 CHLAT Full mission maps 150
- DC0 CHLAT Full mission maps 230
- DC0 CHLAT Full mission maps 280
- Planck Public Release 4 ▼

CMB-S4 Data Repository

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- [Data Releases](#)
- [Data Access](#)
- [How to download data](#)

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CMB-S4 Data Portal

The CMB-S4 Data Portal hosts the CMB-S4 data products and other datasets of interest for the Cosmic Microwave Background community.

The data hosting/transfer capability and permissions are provided by [Globus](#), the Portal website is a discovery, navigation and documentation tool.

For technical details about the portal, see the [About page](#).

Data Releases

- [Data Challenge 0 \(DC0\)](#) - Data download is currently restricted to CMB-S4 Collaboration members
- [Planck Public Release 4 \(Planck PR4\)](#) - Public

Data delivery: data.cmb-s4.org

HTTPS access via
Globus authentication

All CMB-S4 members (can add
Globus ID to membership record)

Filter and bin maps IQU

Map depth in Temperature
and Polarization

HEALPix FITS


Time splits (1/2/4/8/16/32)

Dataset: CMB-S4 DC0 CHLAT Split04 025GHz

- Telescope: Chilean Large Aperture Telescope (CHLAT)
- Split: 04
- Frequency Band (GHz): 025

See [data access](#) on the DC0 page.

Access the data through the Globus web interface:



Download the [file manifest](#) for the exact file sizes and checksums.

Files

- Number of files: 8
- Total size: 15.0 GiB
- [JSON format file manifest](#)

File Name	Datatype	Size
dc0_chlat_t04.01_025_map02_c111.fits	Map: filter+bin iqu	2.3 GiB
dc0_chlat_t04.01_025_map03.fits	Map: tp depth	1.5 GiB
dc0_chlat_t04.02_025_map02_c111.fits	Map: filter+bin iqu	2.3 GiB
dc0_chlat_t04.02_025_map03.fits	Map: tp depth	1.5 GiB
dc0_chlat_t04.03_025_map02_c111.fits	Map: filter+bin iqu	2.3 GiB
dc0_chlat_t04.03_025_map03.fits	Map: tp depth	1.5 GiB
dc0_chlat_t04.04_025_map02_c111.fits	Map: filter+bin iqu	2.3 GiB
dc0_chlat_t04.04_025_map03.fits	Map: tp depth	1.5 GiB

Data delivery: data.cmb-s4.org

Globus web app

Transfer to other HPC

File Manager | Globus

app.globus.org/file-manager?origin_id=38...

File Manager

Panels

Collection: CMB-S4 Data Portal

Path: /datareleases/dc0/mission/chlat/split04/025/

NAME	LAST MODIFIED	SIZE
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dc0_chlat_t04.01_025_map03_...	3/10/2023, ...	1.61 GB
dc0_chlat_t04.02_025_map02_...	3/10/2023, ...	2.41 GB
dc0_chlat_t04.02_025_map03_...	3/10/2023, ...	1.61 GB
dc0_chlat_t04.03_025_map02_...	3/10/2023, ...	2.41 GB
dc0_chlat_t04.03_025_map03_...	3/10/2023, ...	1.61 GB
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dc0_chlat_t04.04_025_map03_...	3/10/2023, ...	1.61 GB
manifest.json	3/24/2023, ...	3.11 KB

Feedback in preparation for DC1

Are these elements of the release appropriate and sufficient?

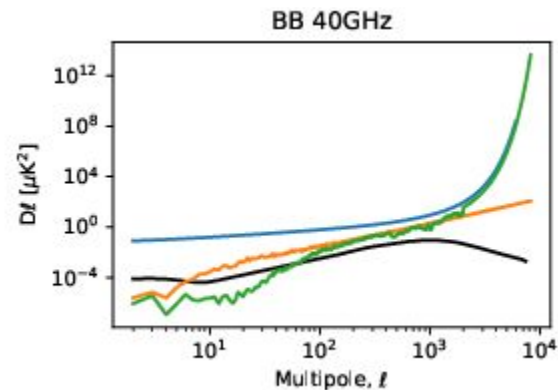
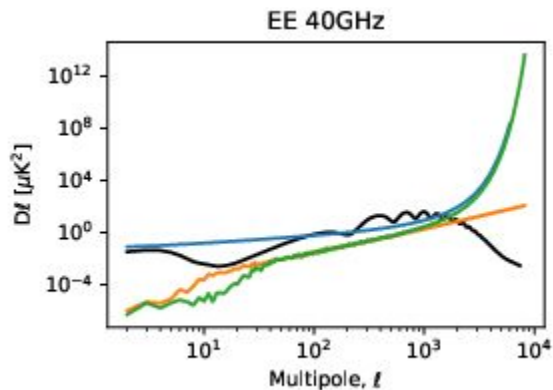
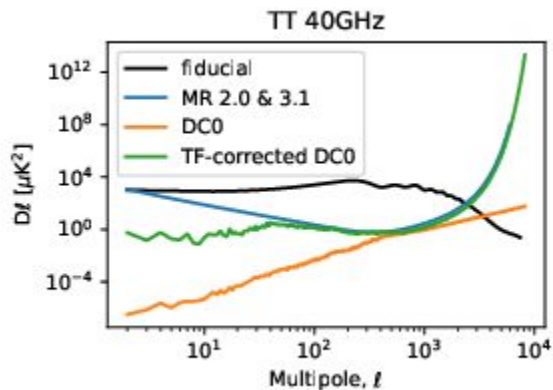
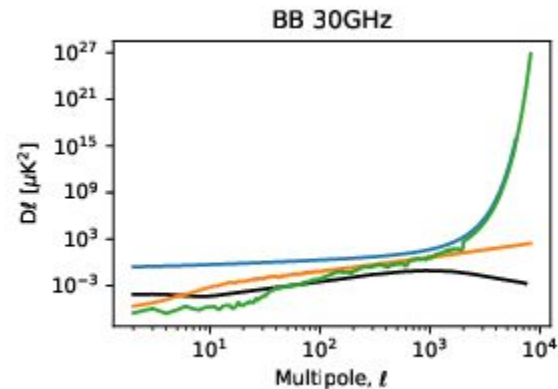
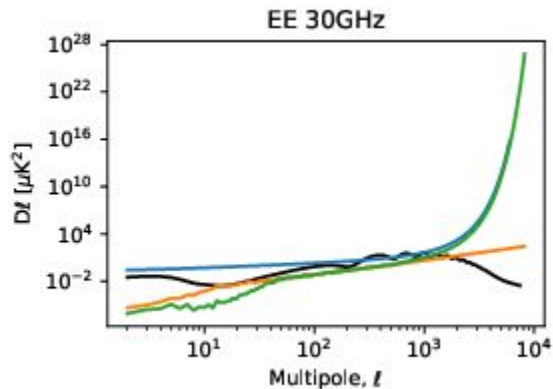
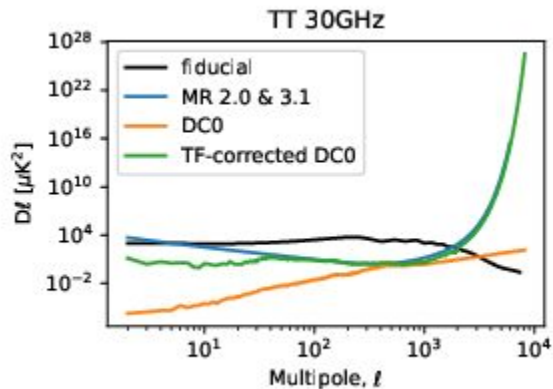
- Data delivery method
- Data format
- Metadata handling

Measurement requirements 2.0 and 3.1 - sensitivity

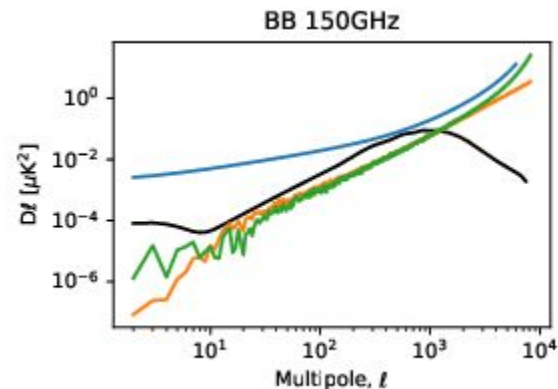
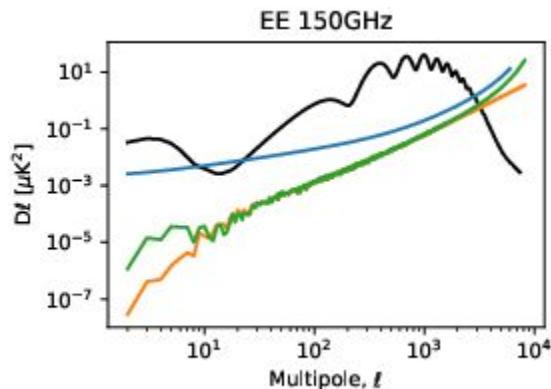
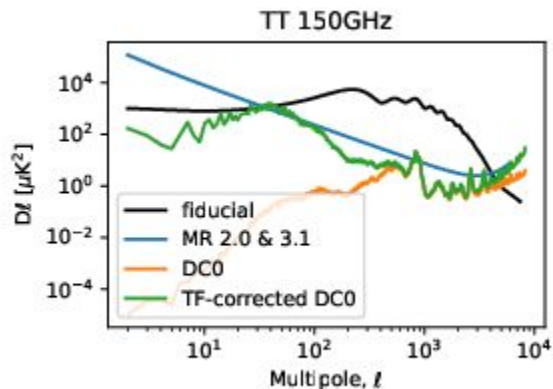
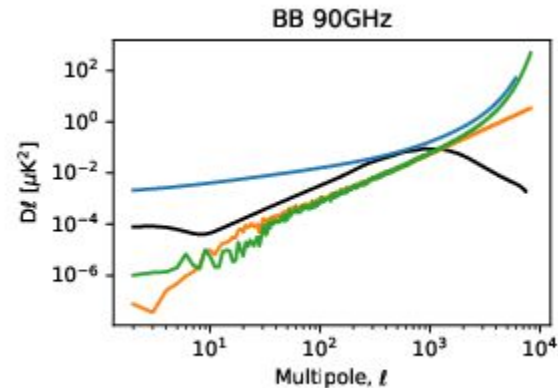
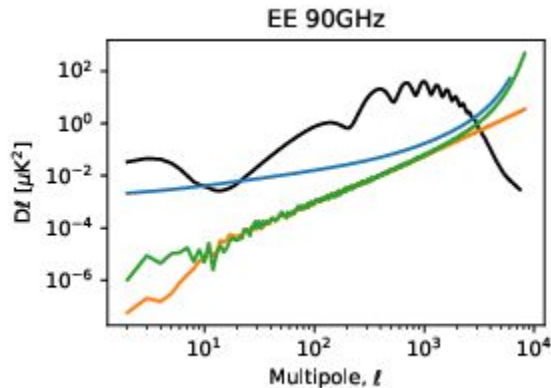
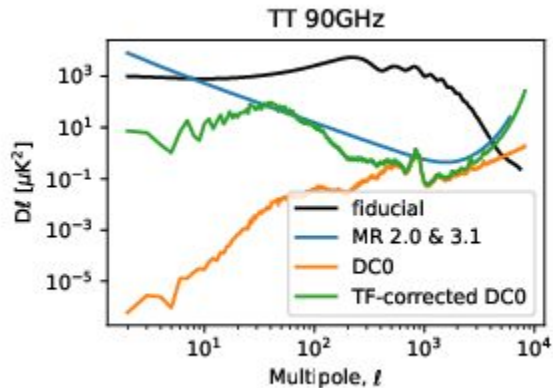
Measurement Requirement 2.0: CMB-S4 shall measure Stokes I , Q , and U over 60% of the sky at frequencies of 25, 40, 90, 150, 230, and 280 GHz, with angular resolutions of 7.4, 5.1, 2.2, 1.4, 1.0, and 0.9 arcminutes, respectively, with I -map noise levels $\leq 21.8, 12.4, 2.0, 2.0, 6.9$, and $16.7 \mu\text{K-arcmin}$, respectively, and Q/U -map noise levels of $\leq 30.8, 17.6, 2.9, 2.8, 9.8$, and $23.6 \mu\text{K-arcmin}$, respectively.

Measurement Requirement 3.1: CMB-S4 shall measure I over 60% of the sky at frequencies of 25, 40, 90, 150, 230, and 280 GHz, with angular resolutions of 7.4, 5.1, 2.2, 1.4, 1.0, and 0.9 arcminutes, respectively, with I -map noise levels $\leq 21.8, 12.4, 2.0, 2.0, 6.9$, and $16.7 \mu\text{K-arcmin}$, respectively.

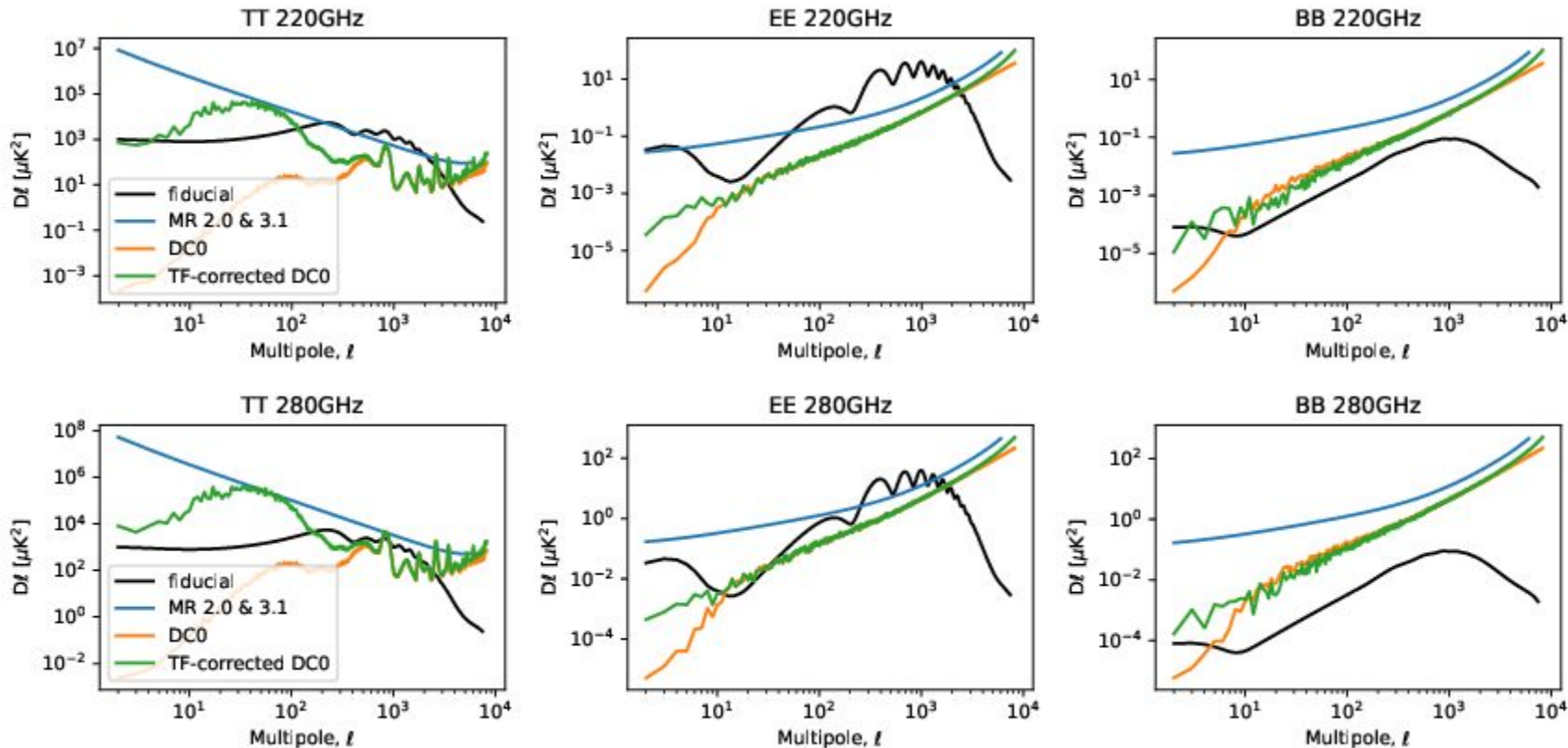
Measurement requirements



Measurement requirements

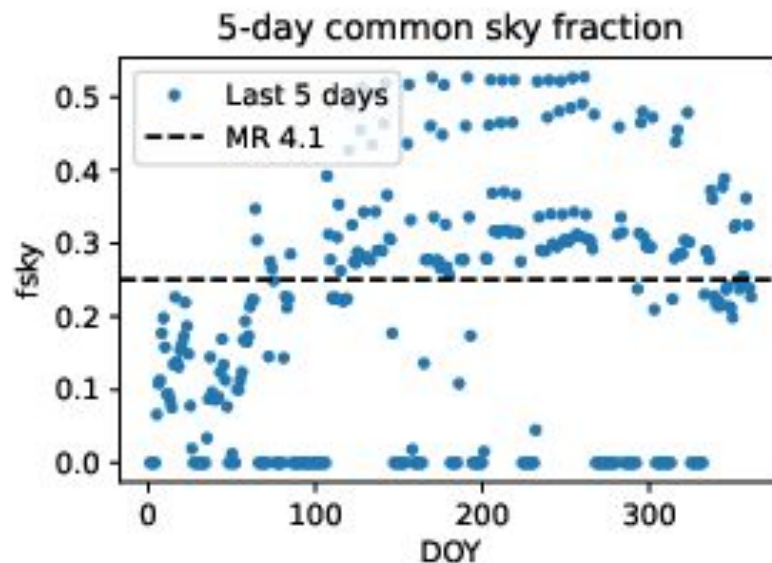
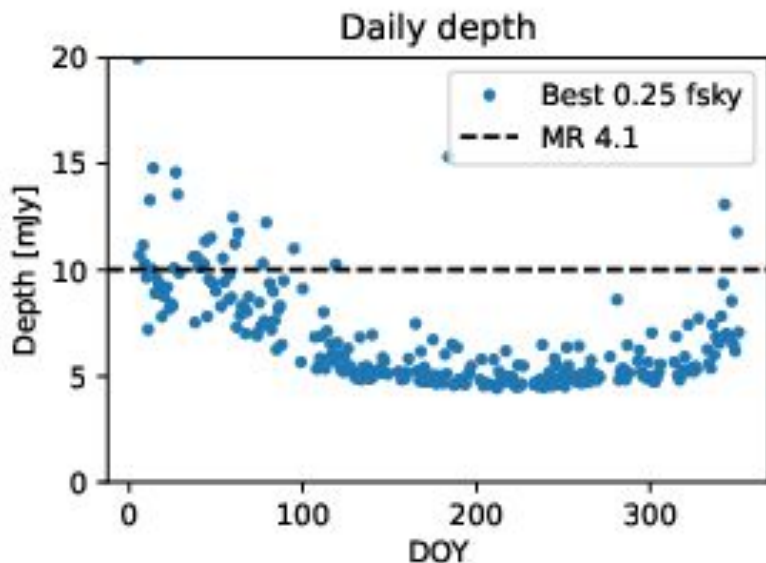


Measurement requirements



Measurement requirement 4.1 - daily depth and common sky

Measurement Requirement 4.1: During normal operations, CMB-S4 shall measure I , Q , and U at 90 and 150 GHz, over $\geq 25\%$ of the sky daily, with angular resolution ≤ 3.0 arcminutes and noise level ≤ 10 mJy/day. At least 90% of the time, the same $\geq 25\%$ of the sky shall be observed for ≥ 5 consecutive days.



Measurement Requirements summary

- Sensitivity Measurement Requirement met in Polarization
- Not met in Temperature at medium and high frequencies due to interaction between atmosphere, scanning strategy and filtering.
- Daily depth and common sky Measurement Requirement met after first 90 days (not nominally part of the survey) and considering "regular operations" (DC-0 also simulates downtime)