



TEMPO Special Operations Management Plan

Updated 1 June 2023

Background

The standard operations of TEMPO will consist of hourly scans across a Field of Regard (FoR) covering greater North America. An added feature of the TEMPO mission will be non-standard or special operations where higher frequency (e.g., ≤ 10 minutes) scans will be performed over a portion or slice of the FoR. As much as 25% of TEMPO's observing time will be dedicated for the special operations. Focus areas of the special operations include disaster events, such as wildfires, dust storms, volcanic eruptions, and industrial accidents, in addition to chemistry studies aimed at improving our understanding of rapidly varying emissions and air pollutants in complex environments. Overall, a myriad of event-based and chemistry experiments can be enhanced by using data from the TEMPO special operational scans, which will be performed during the nominal operations of the mission set to start in October 2023. Some special operational scans will be commenced during the commissioning phase of the mission in coordination with targeted field campaigns. The special operations can also be conducted over slices of the FoR extending further southward and northward from the optimized FoR coverage (Fig. 1).

Experiment Request Submission

Those interested in submitting ideas for using a portion of the time committed for TEMPO special operations need to complete the experiment request form available on the TEMPO Early Adopters website:

https://weather.msfc.nasa.gov/tempo/green_paper.html

As noted on the form, requests are compiled by a coordination team involving the TEMPO Deputy Program Applications Lead (Dr. Aaron Naeger), TEMPO Principal Investigator (Dr. Kelly Chance), and TEMPO Science and validation team member (Prof. Michael Newchurch). After the coordination team approves the request, the experiment abstract will be added to the living TEMPO Green Paper available at the link below.

<https://weather.msfc.nasa.gov/tempo/publications/TEMPO-Green-Paper.pdf>

Experiment Selection Process and Timeline

A steering committee including the coordination team listed above and TEMPO Program Scientist (Dr. Barry Lefer) and Deputy Principal Investigator (Dr. Xiong Liu) will prioritize and commence scheduling logistics for experiments requesting the special operations. The committee will evaluate the investigator responses in the request form when selecting and prioritizing experiments for special operation implementation. The following criteria will be assessed when selecting and prioritizing experiments: (1) scientific value; (2) societal benefit (only applicable to applied experiments); (3) time and resources available to the investigators for performing the

experiment; (4) experiment logistics including synergy with other experiments. If additional information is needed to fully evaluate the experiment, the committee will contact the primary investigators. After evaluation, the steering committee will arrange meetings with investigators of the selected experiments to ensure optimal execution of the special operations to achieve the experiment goals.

The first round of experiments selected for implementation during the nominal operations will be announced by August 2023, followed by initial coordination activities with investigators. Additional experiments will be selected and implemented during the mission on an as needed basis.

Experiment Impacts and Outreach Plan

Investigators of the selected experiments can expect follow-up communication with the coordination team on their progress in using the TEMPO data products, which can include requests to share their results at TEMPO Early Adopter and/or Science Team meetings. For broader outreach, the TEMPO Deputy Program Applications Lead may communicate with investigators to share impacts stories from the experiments on NASA Applied Sciences Program websites and newsletters (e.g., NASA Health and Air Quality Newsletter).

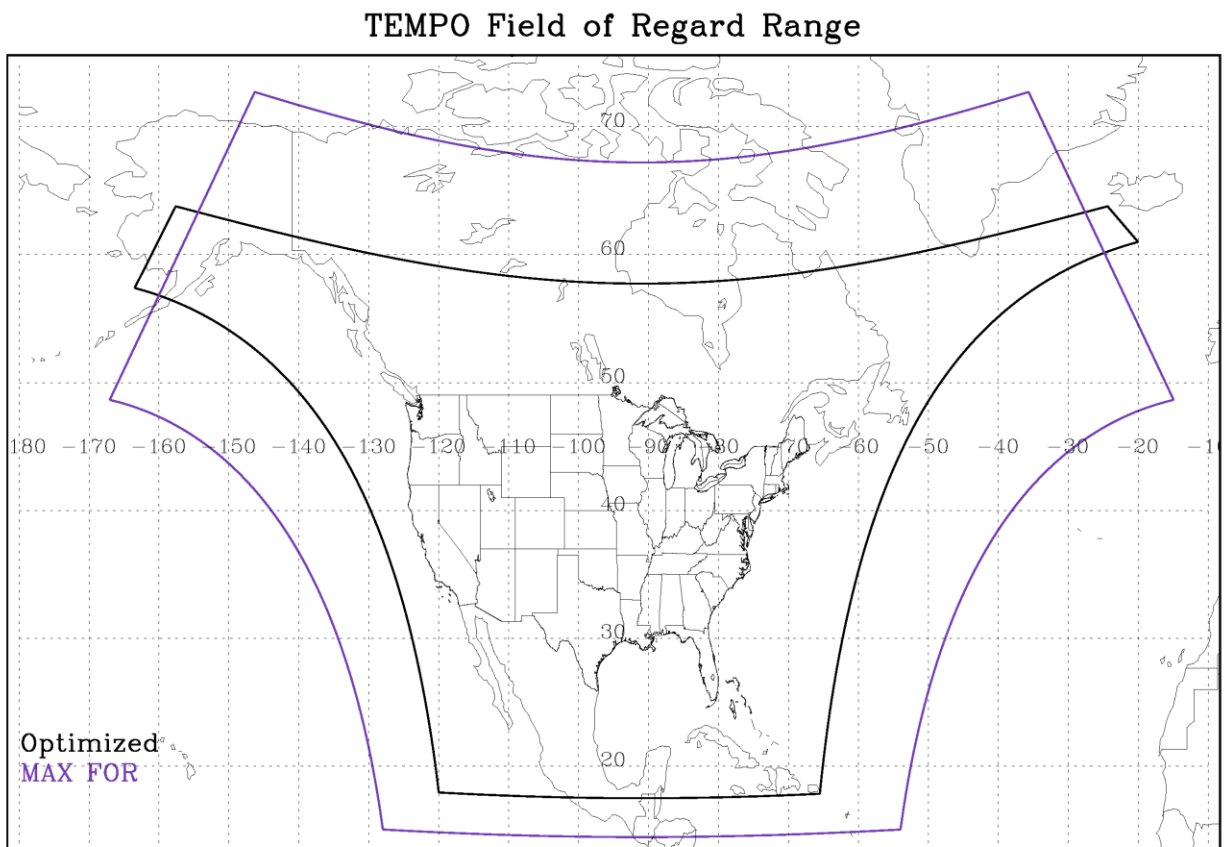


Figure 1. Map showing *Optimized (standard) FoR* and *MAX (Maximum) coverage of TEMPO FoR scans*, which includes both southmost and northmost scan coverages.