



**Associate Laboratory Director's review of the  
TPC Outer Tracker (TPOT)  
July 20, 2022  
Charge to the Review Committee**

The TPC Outer Tracker, TPOT, is a Micromegas Tracking detector proposed as an upgrade to the sPHENIX Time Projection Chamber (TPC) to provide precise fixed space points on particle trajectories to assist in the reconstruction of rapidly fluctuating space-charge distortions in the TPC volume. The TPOT upgrade includes the production, assembly, and installation of eight Micromegas modules between the sPHENIX electromagnetic calorimeter and the Time Projection Chamber, including associate services for operation during the FY23-FY25 runs of sPHENIX.

The purpose of this review is to assess the technical feasibility, interfaces, schedule and cost, of the TPOT upgrade, its readiness for installation in sPHENIX in 2022, and to evaluate the risks that the TPOT introduces to the sPHENIX schedule and program.

In carrying out its review, the review committee is requested to consider the following questions:

- Are all the components for TPOT for installation and integration into sPHENIX produced and within specifications?
- Are the quality control tests, acceptance tests, and characterization of TPOT modules within specifications?
- Is the schedule of the TPOT sufficiently well understood and matched to the plan for installation in sPHENIX?
- Are the risks introduced by the TPOT upgrade into the successful operation of sPHENIX well understood, and are sufficient plans to mitigate these risks in place?
- Are the interfaces and integration with sPHENIX and RHIC well understood?
- Is the gas system properly understood, including safety reviews, as needed for operation in sPHENIX?
- Is the ES&H properly managed?
- Is the software for calibrations for TPOT and production software for utilizing TPOT for TPC calibrations in place?

- Are the costs of the TPOT sufficiently well understood, and are the resource needs required to complete the TPOT upgrade fully identified?

The review will take place via zoom on July 20, 2022. A close out will be presented to the sPHENIX team and NPP management prior to adjourning. A report should be sent to my office by close of business on July 29, 2022.

I very much appreciate your willingness to lend your time and expertise to this important step in the sPHENIX TPOT review process and look forward to receiving your assessment.

## **Review Committee**

### **TPC/design/electronics/gas system**

Flemming Videbaek  
Nikolai Smirnov (YALE)  
Vinnie Polychronakos (BNL)  
Bo Yu (BNL)

### **Integration/installation/readout**

Russ Feder (BNL)  
Rahul Sharma (BNL)  
Dave Lynn (BNL)  
Jack Fried (BNL)

Sincerely,



Haiyan Gao  
Associate Laboratory Director for Nuclear and Particle Physics