

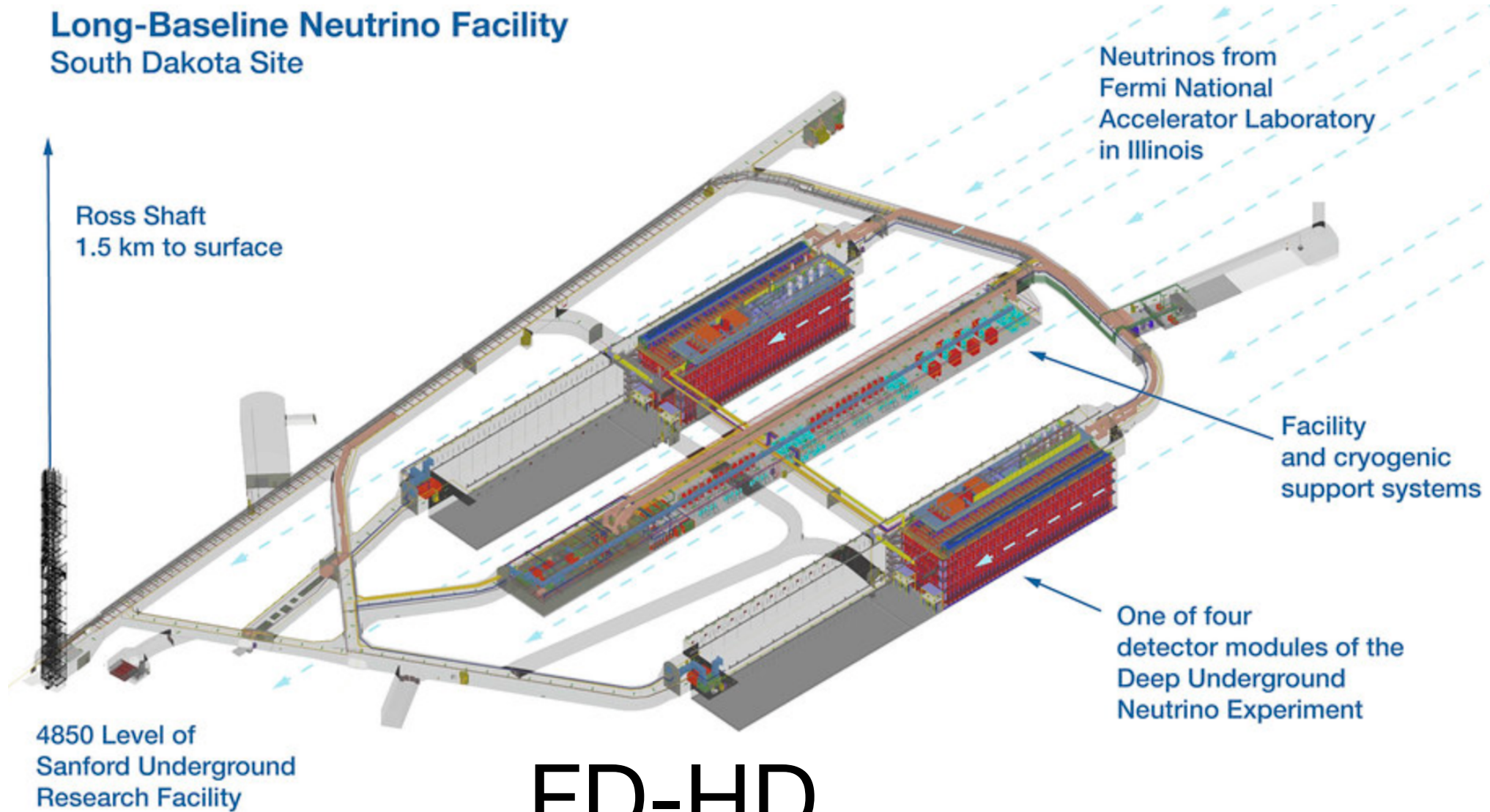
Sensitivity Study of the FTMS for the Deep Underground Neutrino Experiment

SUMMER SCHOOL AT THE IFIC DUNE LABORATORY

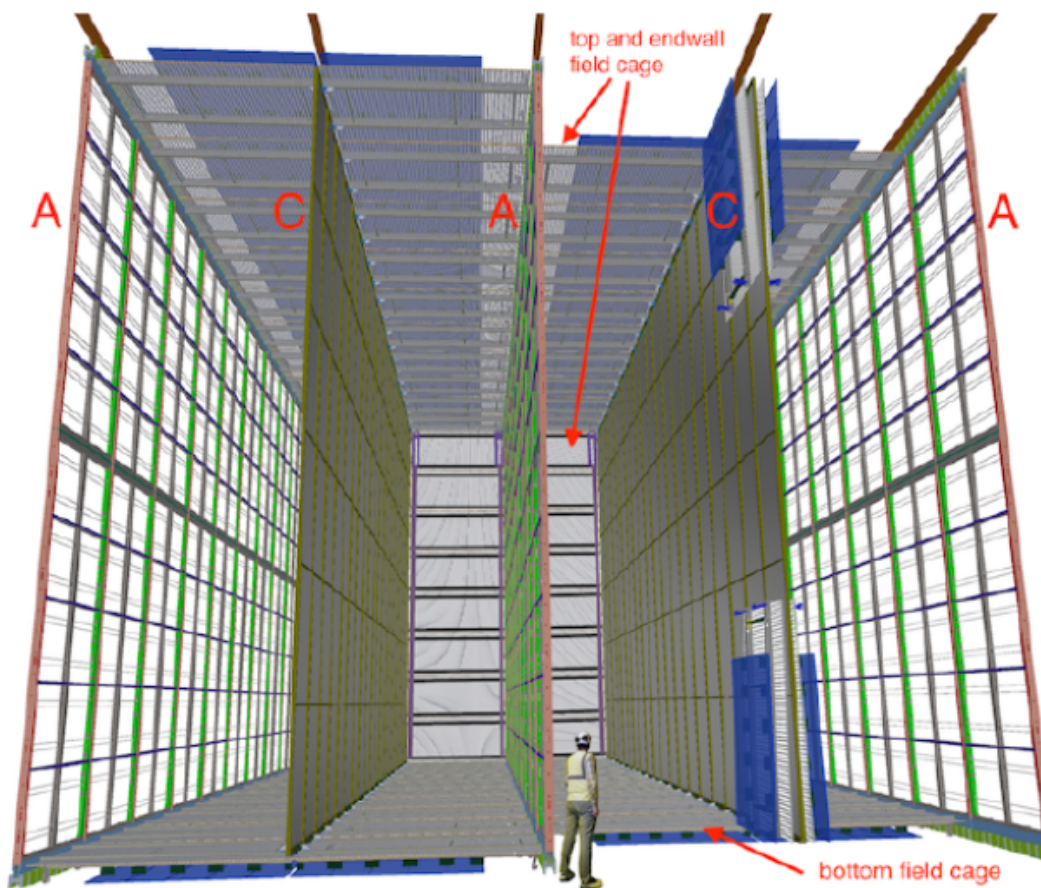


Temperature Monitoring System (TMS)

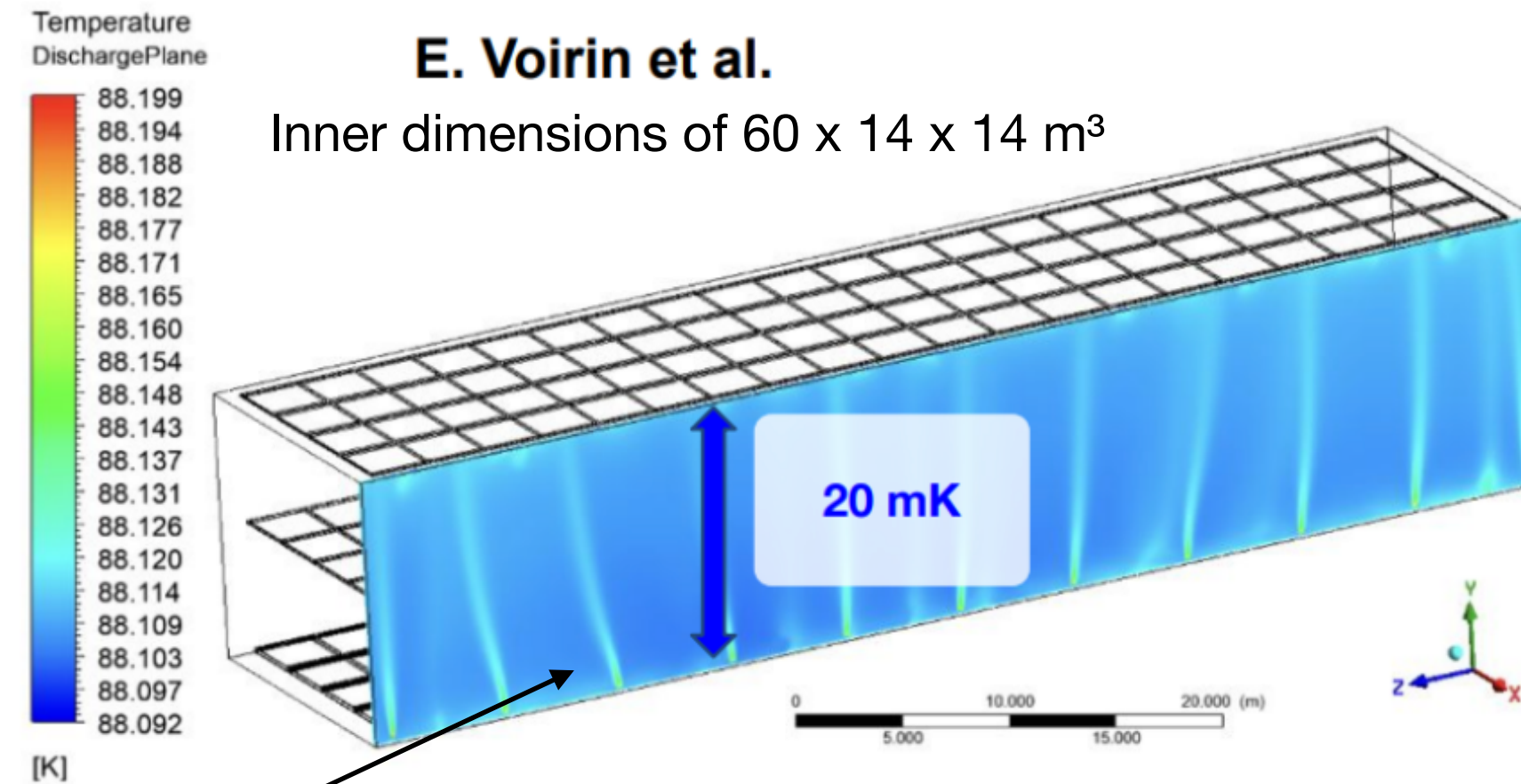
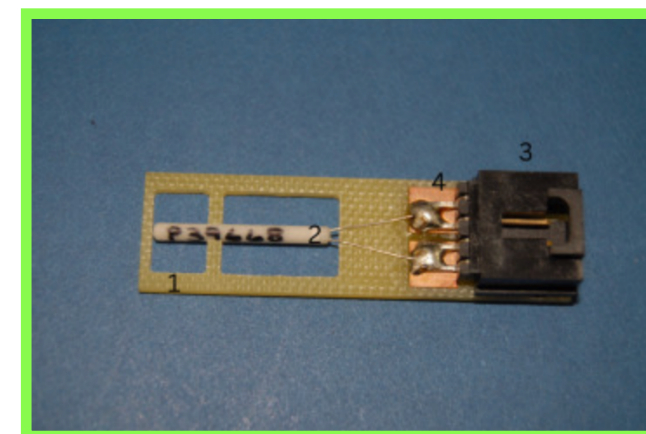
Is an essential subsystem of the DUNE Far Detector (FD) Liquid Argon Time Projection Chambers (LArTPCs)



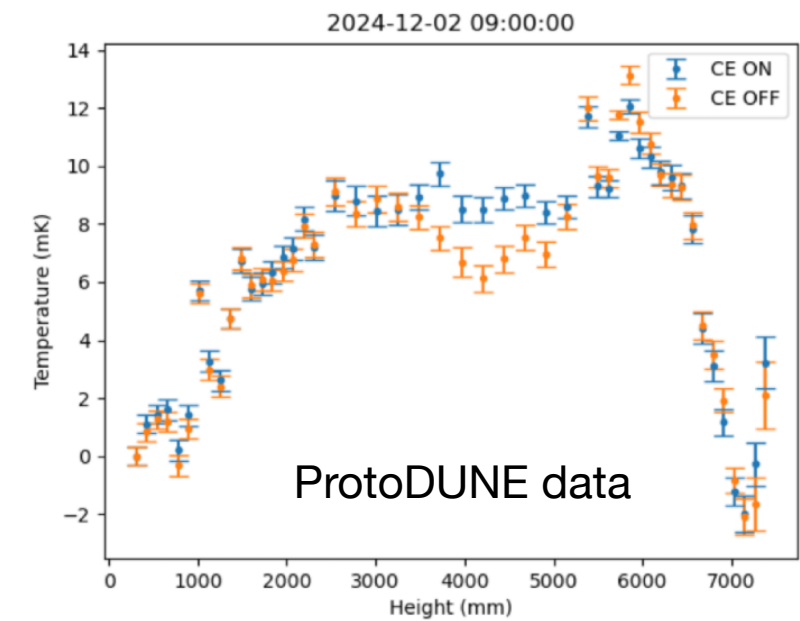
FD-HD



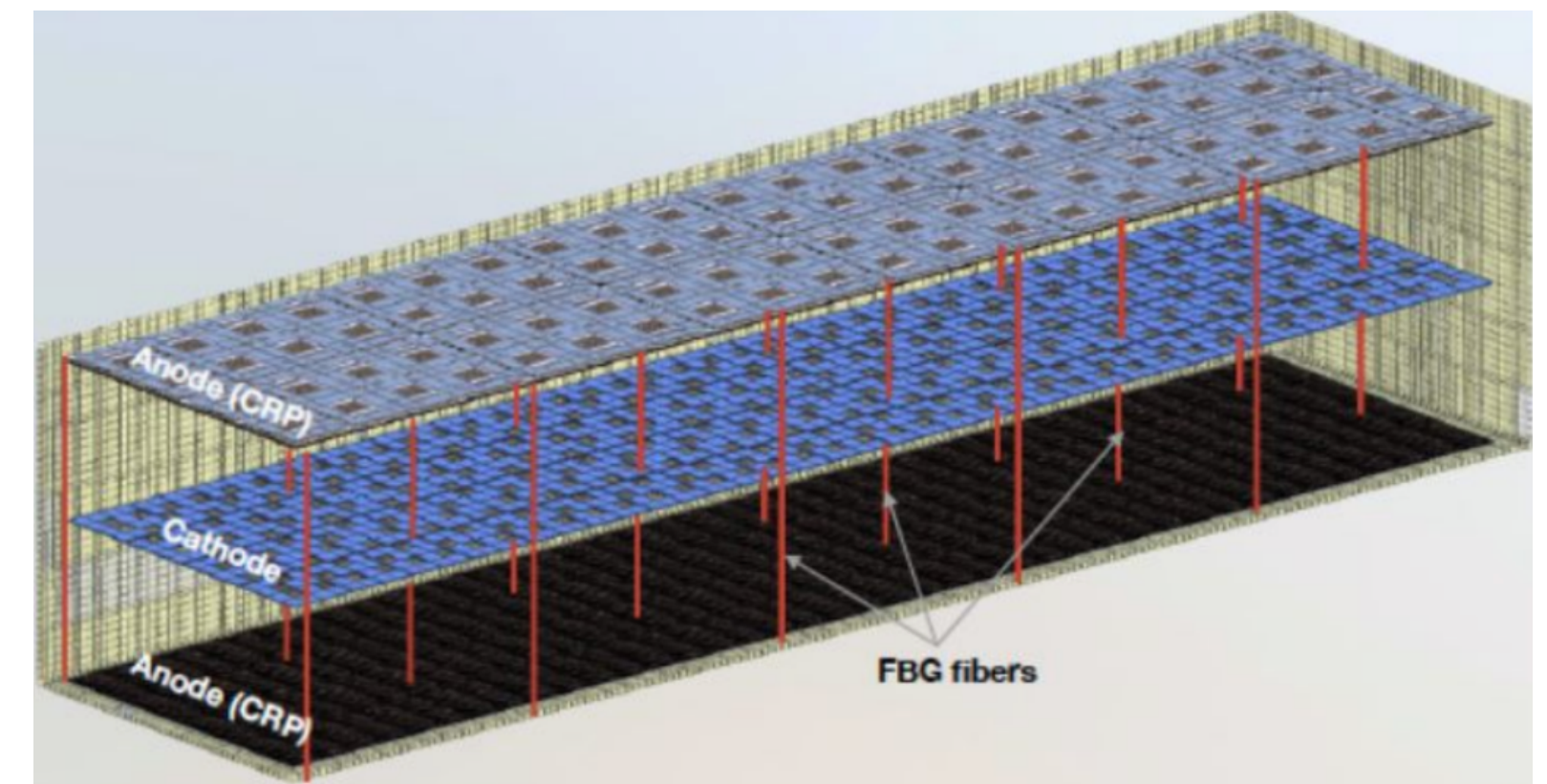
Resistance Temperature Detectors (RTDs)



Argon = excellent scintillator as Anselmo explained!

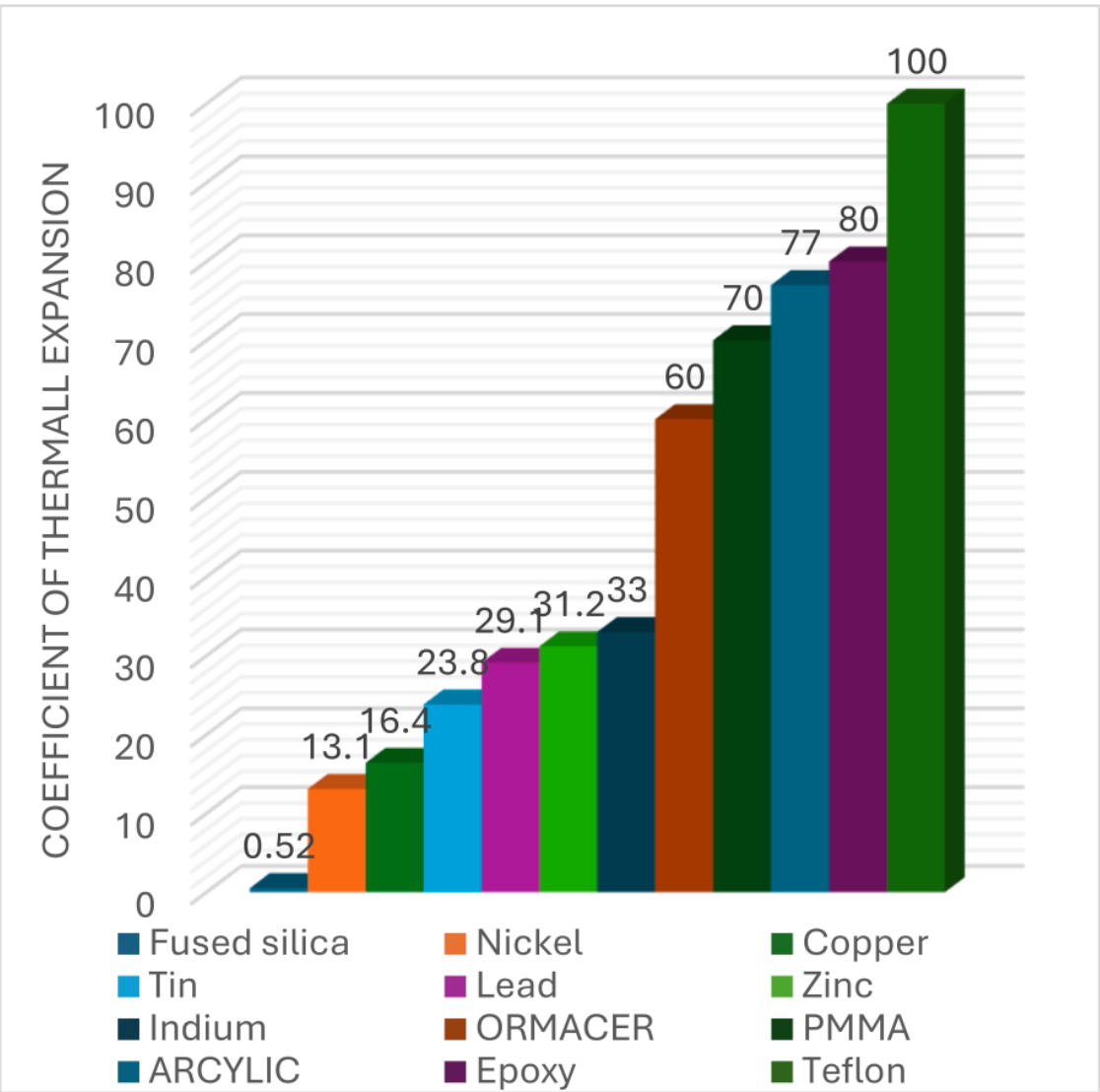
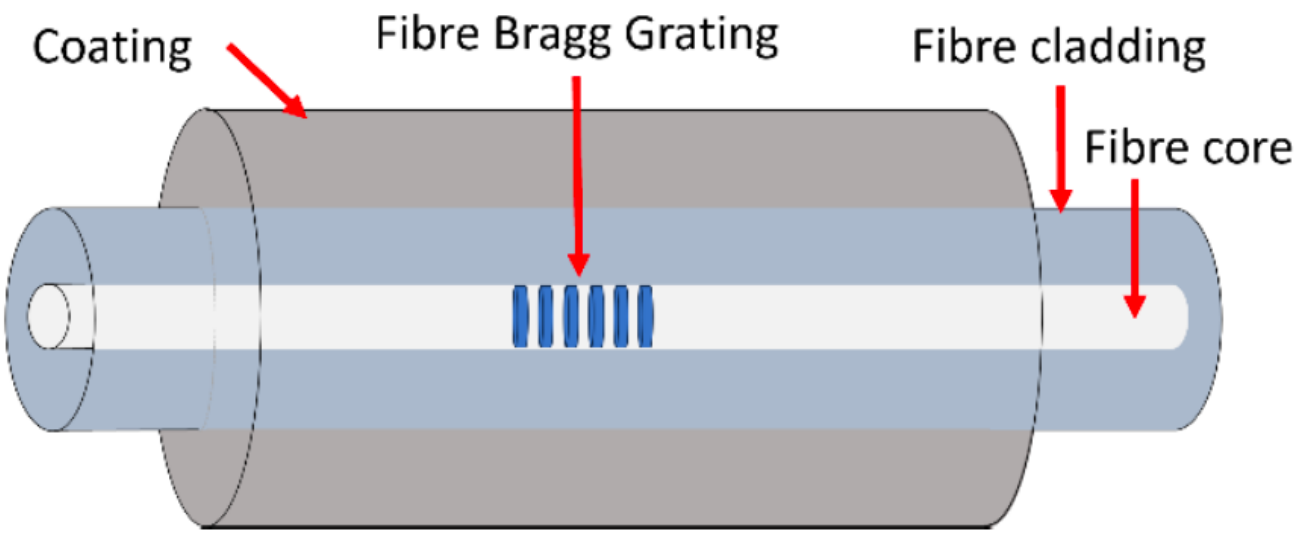
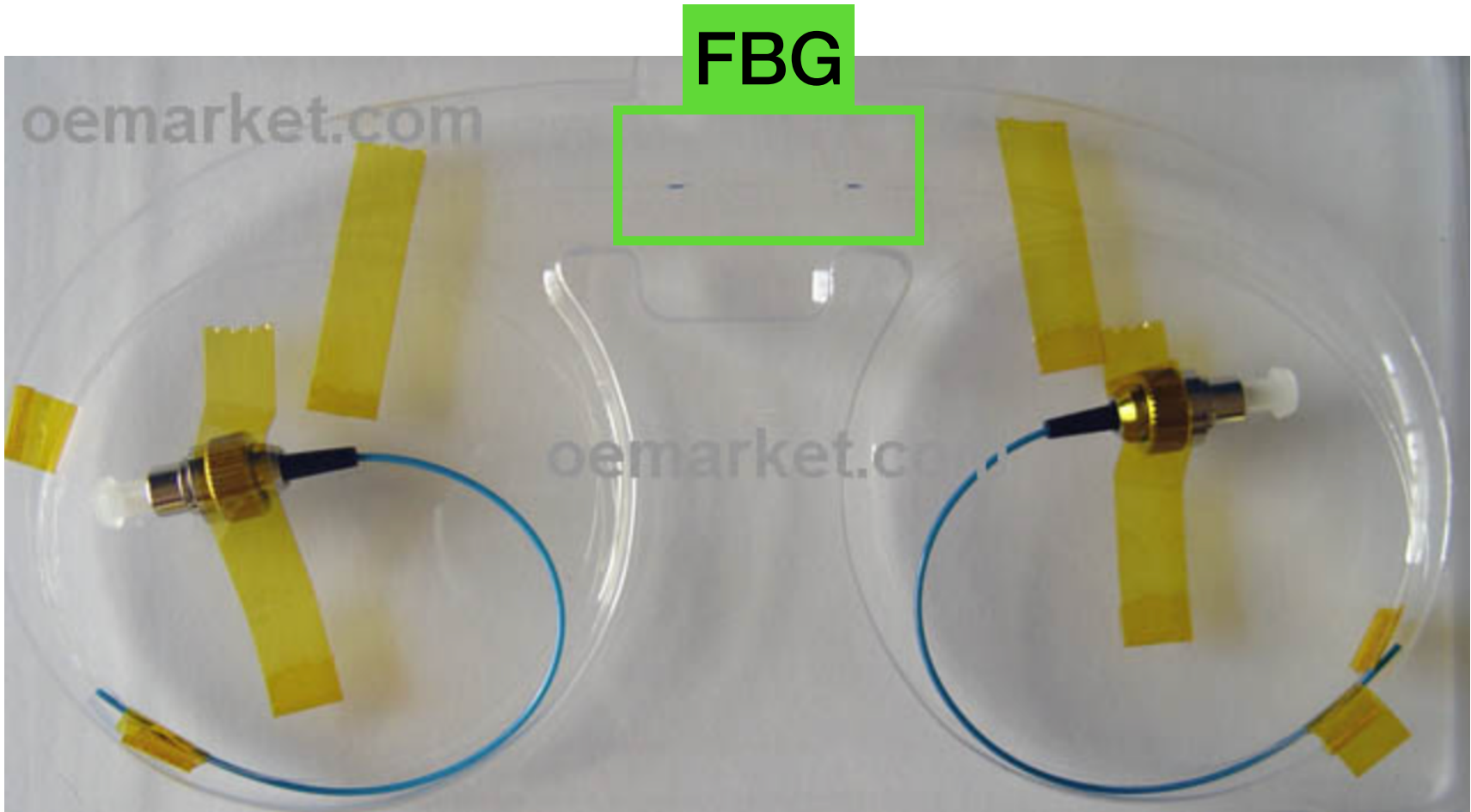
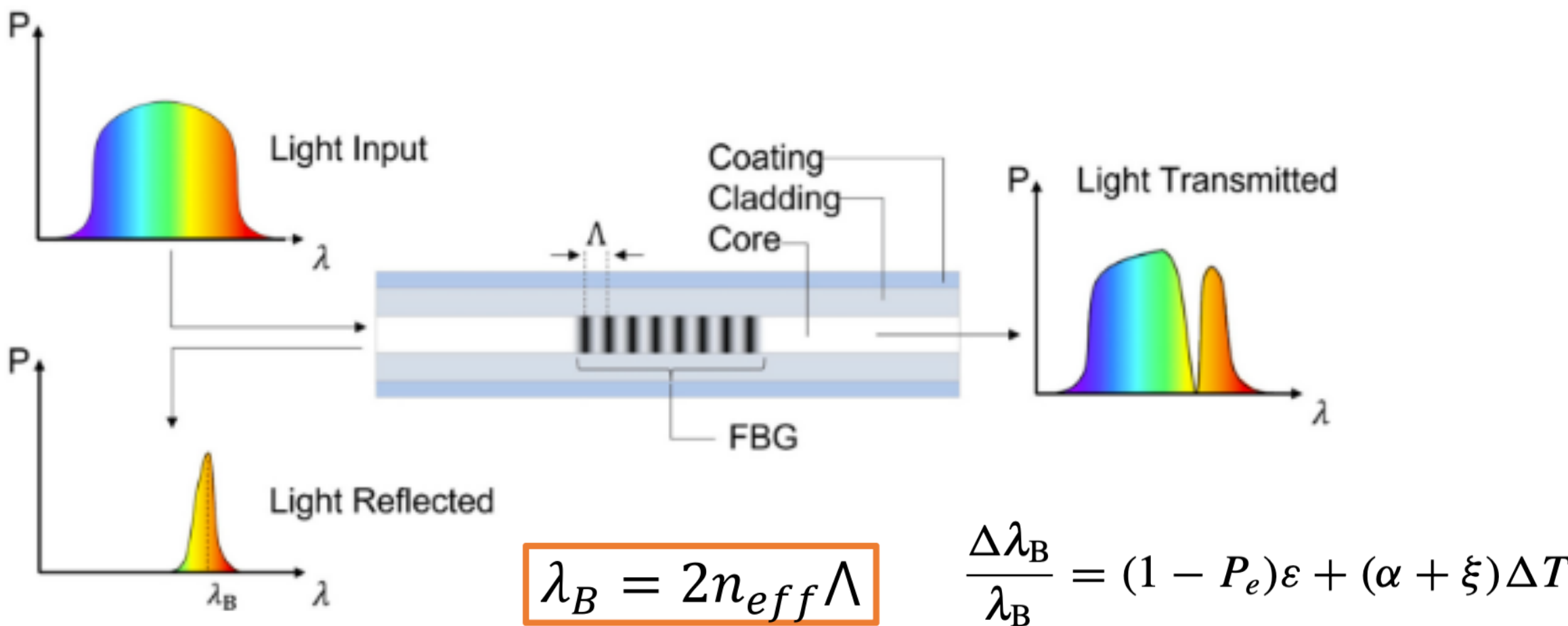
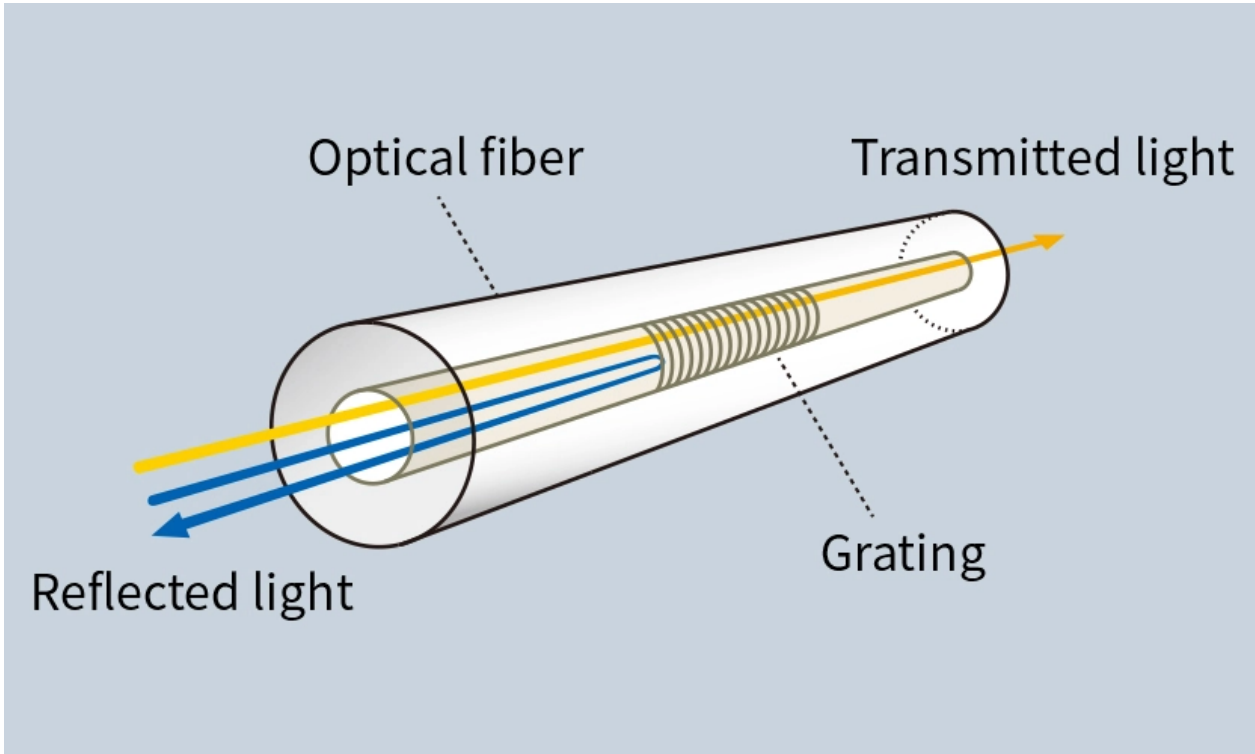


FD-VD



Fiber Bragg Grating (FBG)

Fiber Bragg Gratings (FBG) are optical fiber type devices that form diffraction gratings in the core of an optical fiber and function as an optical filter. The FBG can select the light transmitted through the optical fiber core, and by separating the transmitted light from the reflected light, the FBG serves as an optical filter.

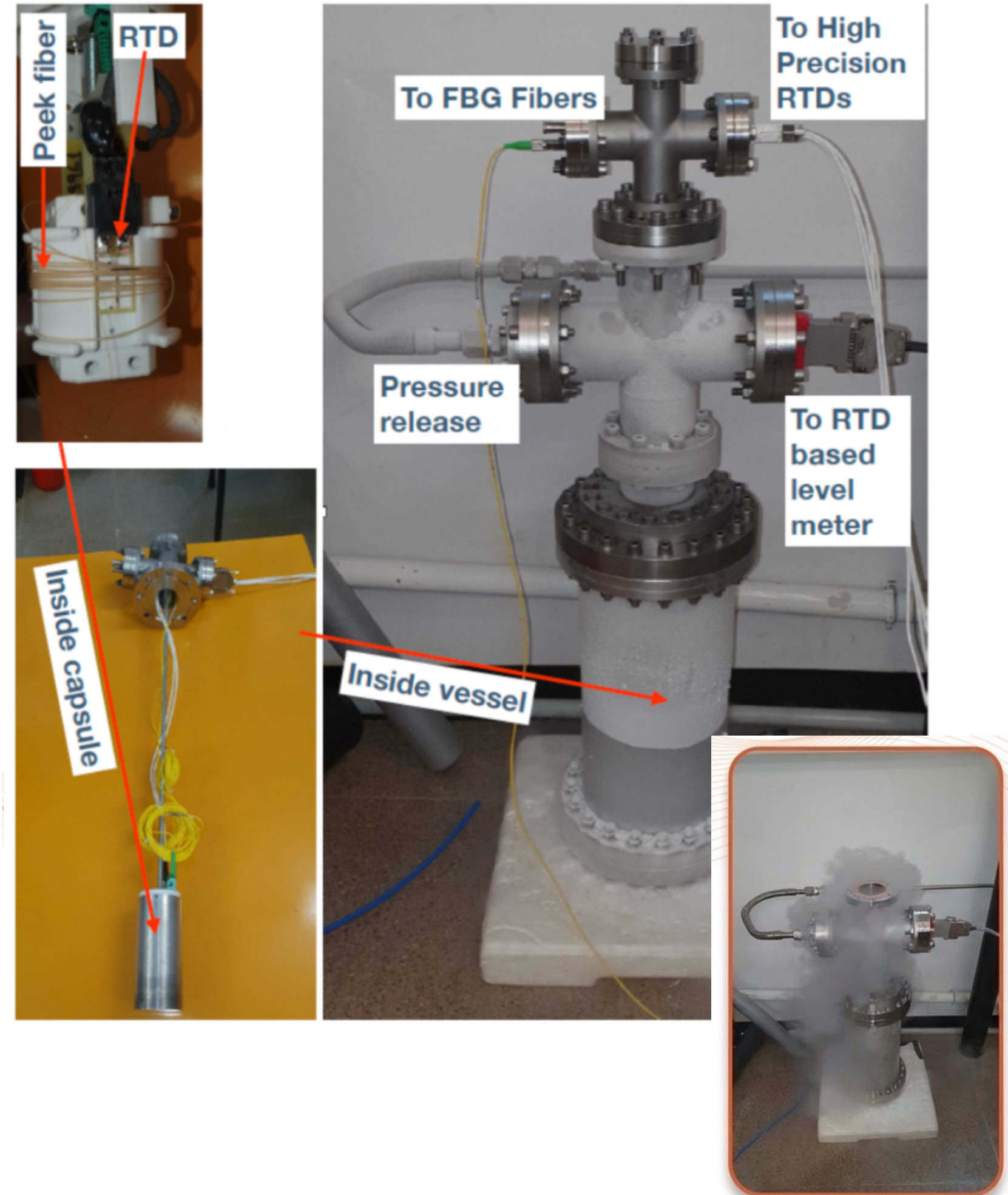


Laboratory: Sensitivity Tests

LN2:



Components:

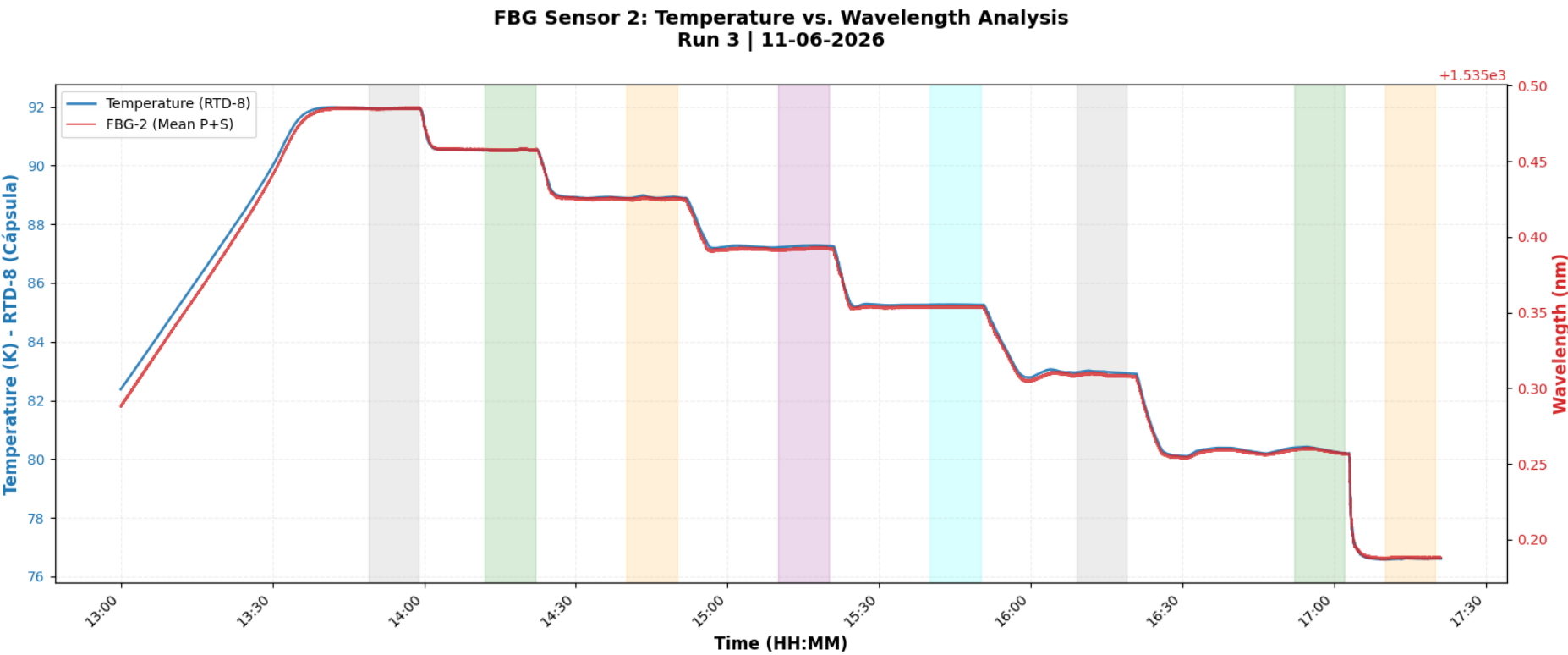
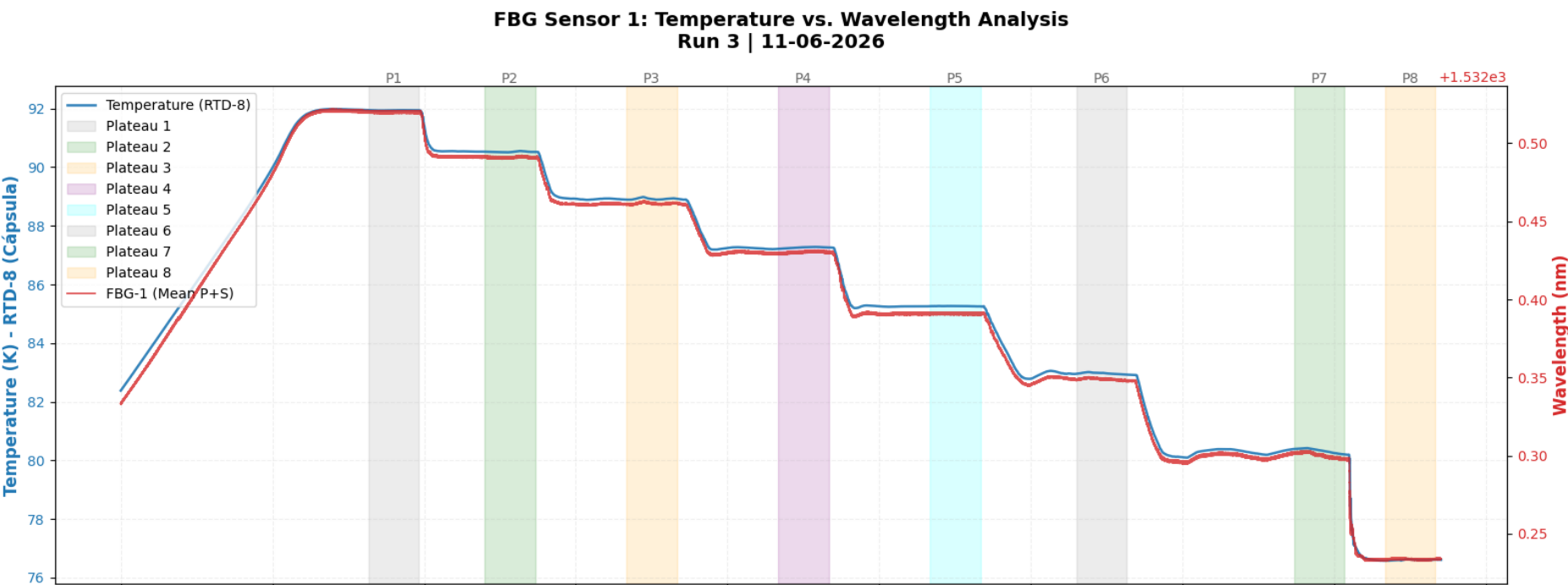


Connections:

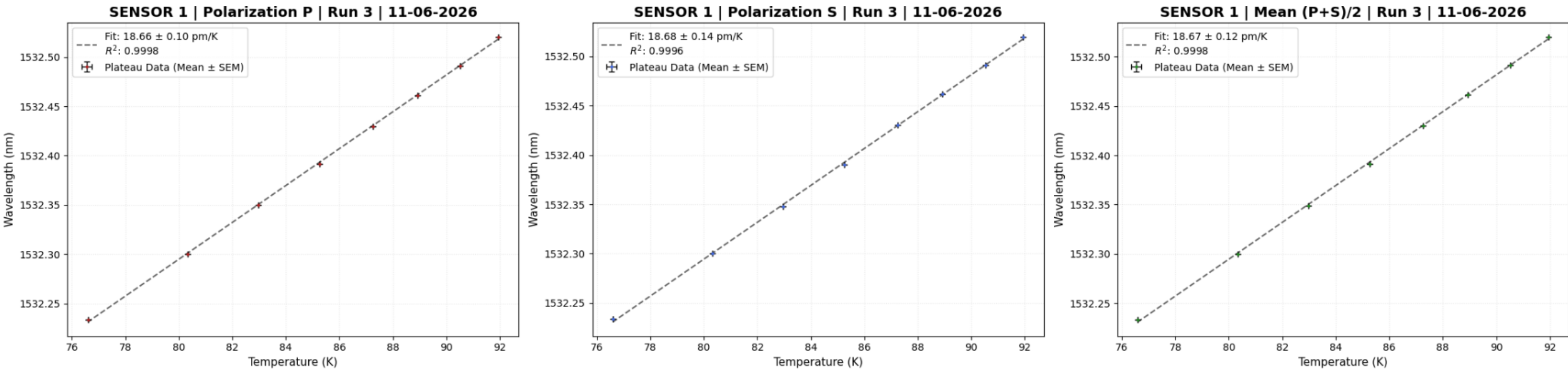


Data: Sensitivity estimation

PEEK-4 (450µm): Run 3 | 11-06-2026
FBG Wavelength and RTD Temperature Profiles
(Shaded areas represent defined plateaus)



Sensitivity Analysis: Fiber: PEEK-4 (450µm) | Run 3 | 11-06-2026 | 2 Sensors
Sensor 1 - Polarization & Mean Comparison



Thermal Sensitivity

Coating: PEEK (400 µm)

20.62 ± 0.16 pm/K

Coating: ORMOCER (250 µm)

7.19 ± 0.11 pm/K

Coating: ORMOCER-T (250 µm)

4.71 ± 0.06 pm/K

Coating: PEEK (200 µm)

3.09 ± 0.02 pm/K

Coating: Polyimide (200 µm)

3.64 ± 0.05 pm/K

30 fm

interrogator
resolution

1.5 mK

system
resolution

Your test will provide us with more information about the fiber's thermal sensitivity and allow us to compare it with our other fibers!!

Documents for the Summer School

IFIC Summer School 2026: DUNE neutrino group

14-24 juillet 2026
Universe
Fuseau horaire Europe/Madrid

Vue d'ensemble

Ordre du jour

Liste des contributions

Ma conférence

Mes contributions

Liste des participants

Commence le 14 juil. 2026 à 11:30

Se termine le 24 juil. 2026 à 13:30

Europe/Madrid

Universe

1001-Primera-119 - Nave. Exp. Sala de Reuniones

Memoria práctica Summer School_...

SUMMER SCHOOL AT THE IFIC DUNE LABORATORY

Sensitivity Study of the Fiber-Optic Temperature Monitoring System for the Deep Underground Neutrino Experiment

1. INTRODUCTION

The DUNE FD-VD will be the largest Time Projection Chamber (TPC) ever constructed, designed to operate continuously for two decades without access to its internal cryogenic or detector components. Given this constraint, comprehensive and reliable monitoring is essential to minimize operational risks. In addition to supporting detector operations and diagnostics, a high-precision Temperature Monitoring System (TMS) provides a valuable complementary tool for

Slack

ific_summer_programme_2026

Hola!

Xabier Arrue 14:41

Hola a todos!

Anselmo Cervera Villanueva 14:47

Por favor, confirmad que estais leyendo estos mensajes

Este es el indico que hemos creado: indico.ific.uv.es/event/8691

Iremos subiendo el material

Pablo 16:38

confirmo que se lee

Anselmo Cervera Villanueva 16:41

Has visto el indico ?

Pablo 16:45

se ve perfecto

Juan 18:25

Hola a todos! Confirmo que se lee

Anselmo Cervera Villanueva 19:56

OK, todavía no esta completo. Mañana intento acabarlo y subimos la documentacion. Por el momento podeis ir echandole un ojo a nuestra web. neutrinos.ific.uv.es

Enviar un mensaje a #ifc_summer_programme_2026

<https://indico.ific.uv.es/event/8691/>

HAVE FUN!!

