



# Microgravedad Simulación 3D

Curso  
2023/2024



12 JUNIO  
2024

ISMIE  
Madrid

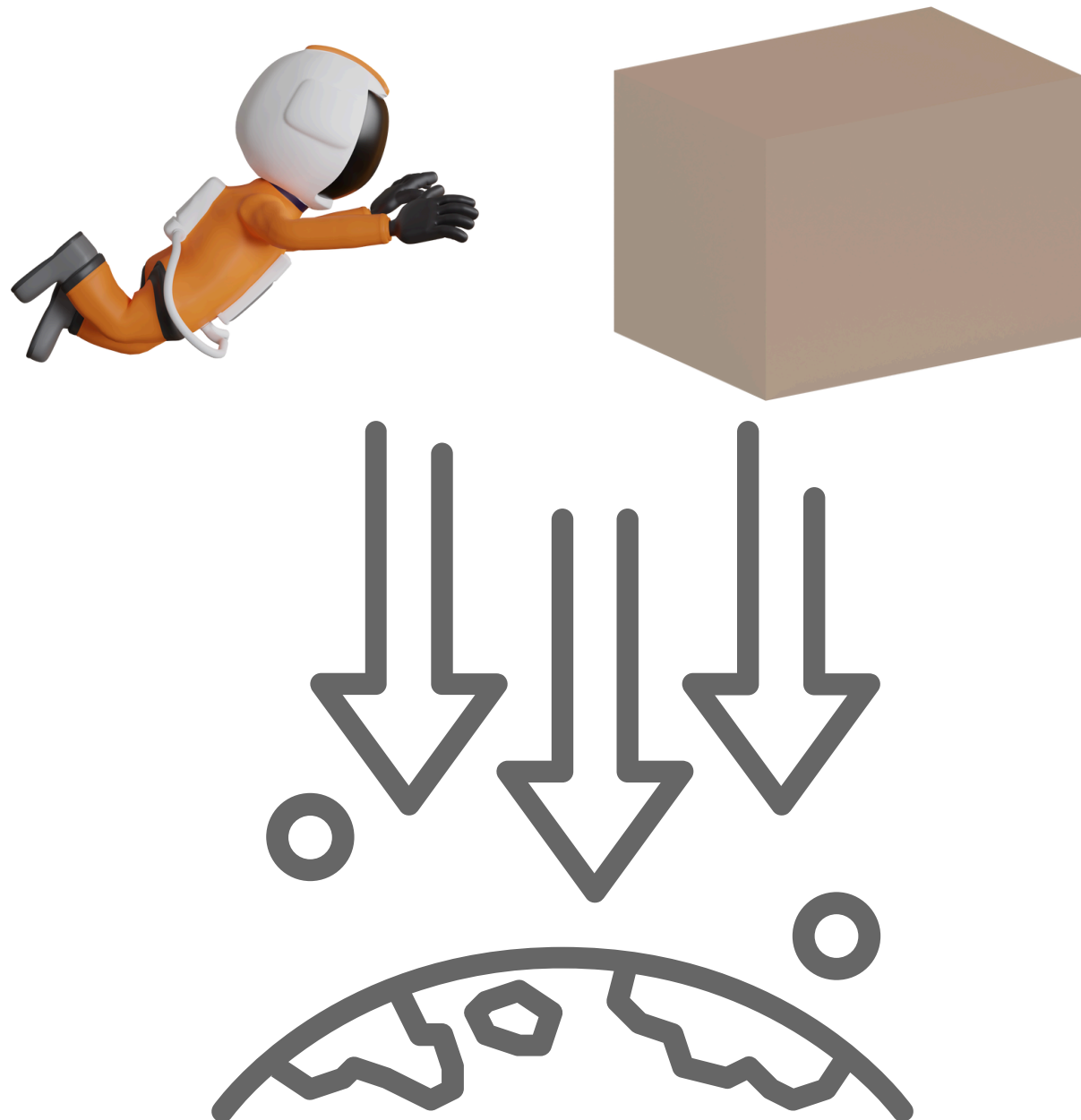
Tutor  
**David Fernández Jiménez**

Alumnos  
**George Bitar**  
**Aitor Domínguez**  
**Óliver Gómez**

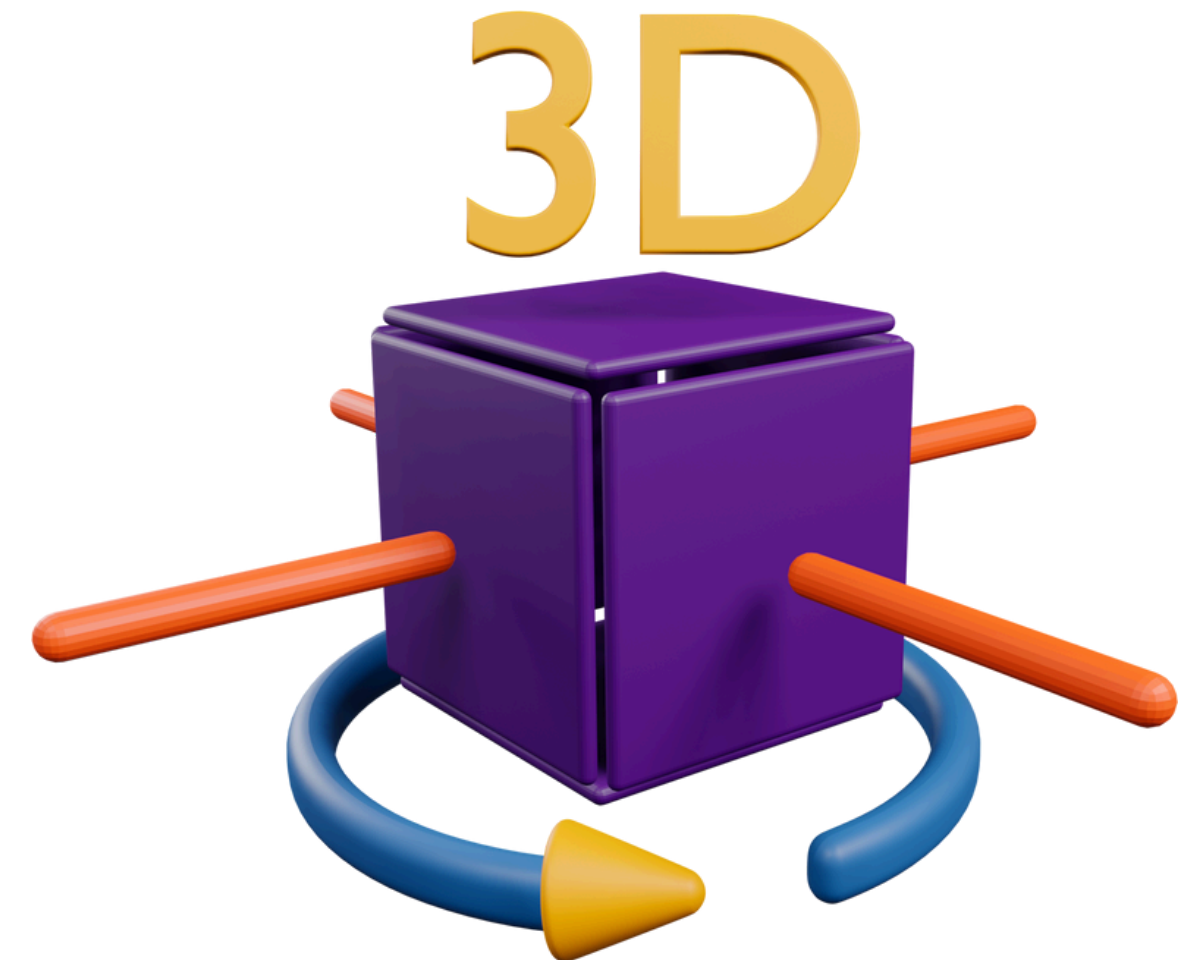


# Objetivos

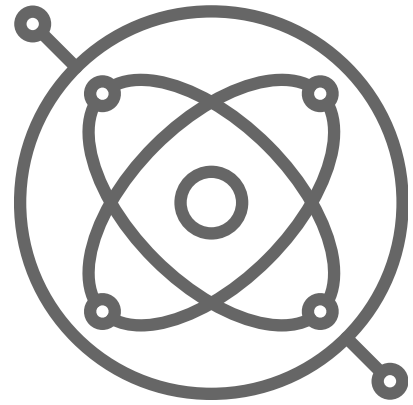
**Microgravedad**  
**Duración del instante**



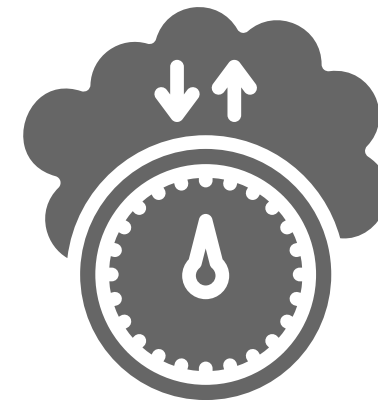
**Simulación giros**  
**Caja de Experimentos**



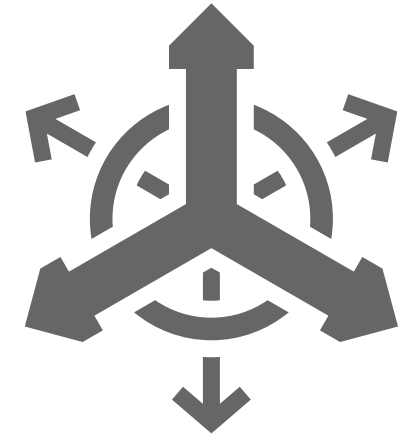
# Elementos necesarios



**Giroscopio**



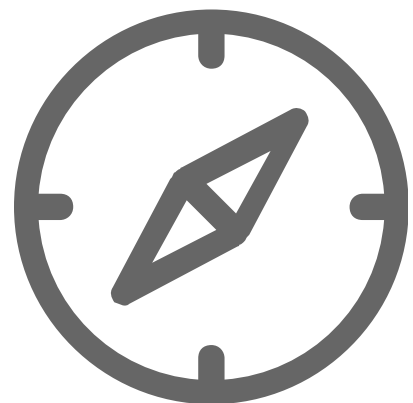
**Sensor Presión**



**Acelerómetro**



**Data Logger**



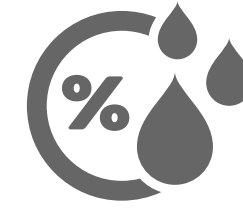
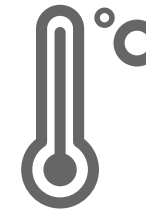
**Magnetómetro**



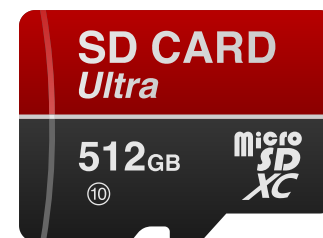
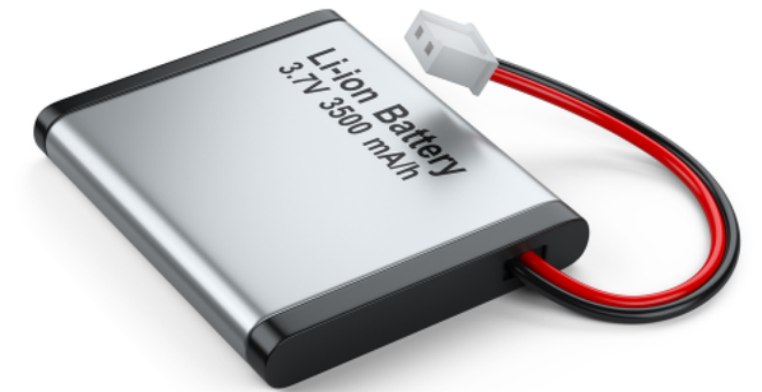
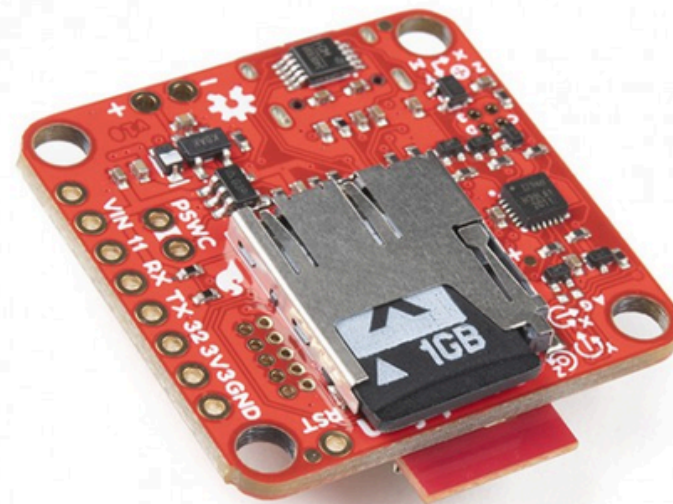
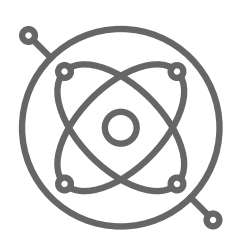
**Batería**

# Propuesta

BME280



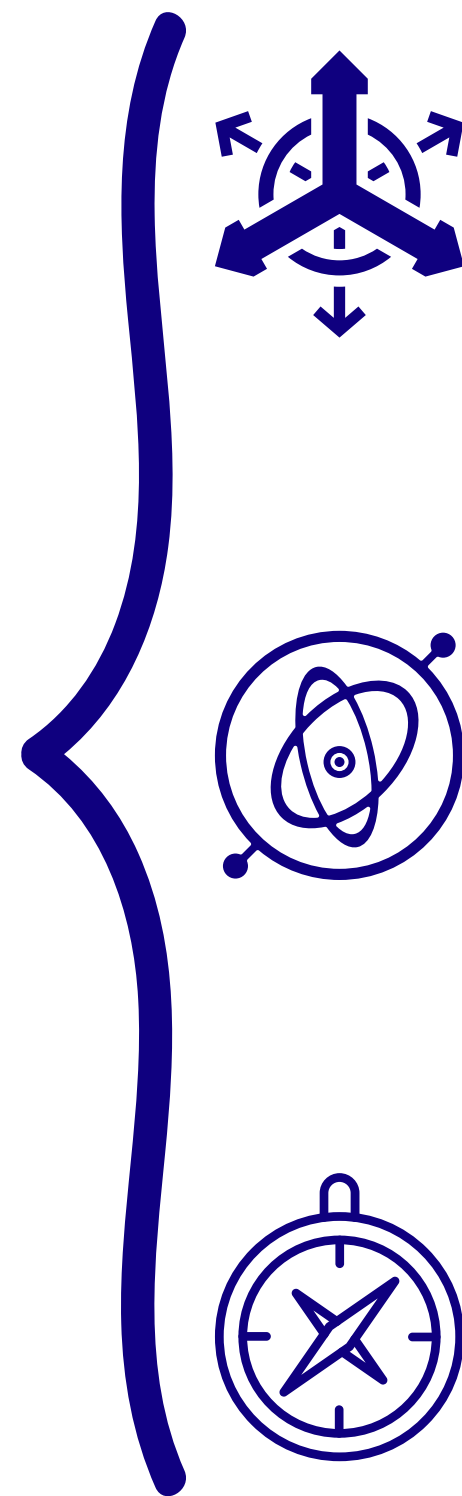
ICM-20948



10 Hz

# Ángulos: Yaw, Pitch y Roll

IMU  
ICM-20948  
TDK InvenSense

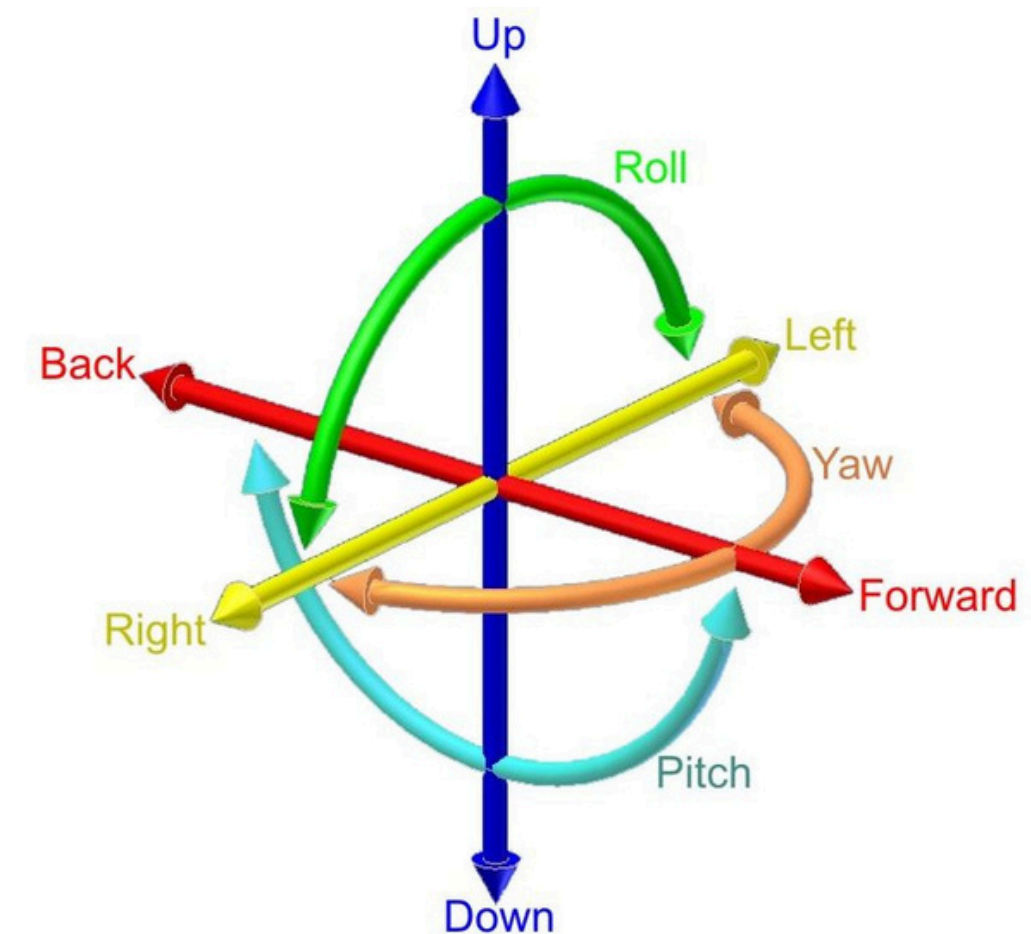


accel\_x  
accel\_y  
accel\_z

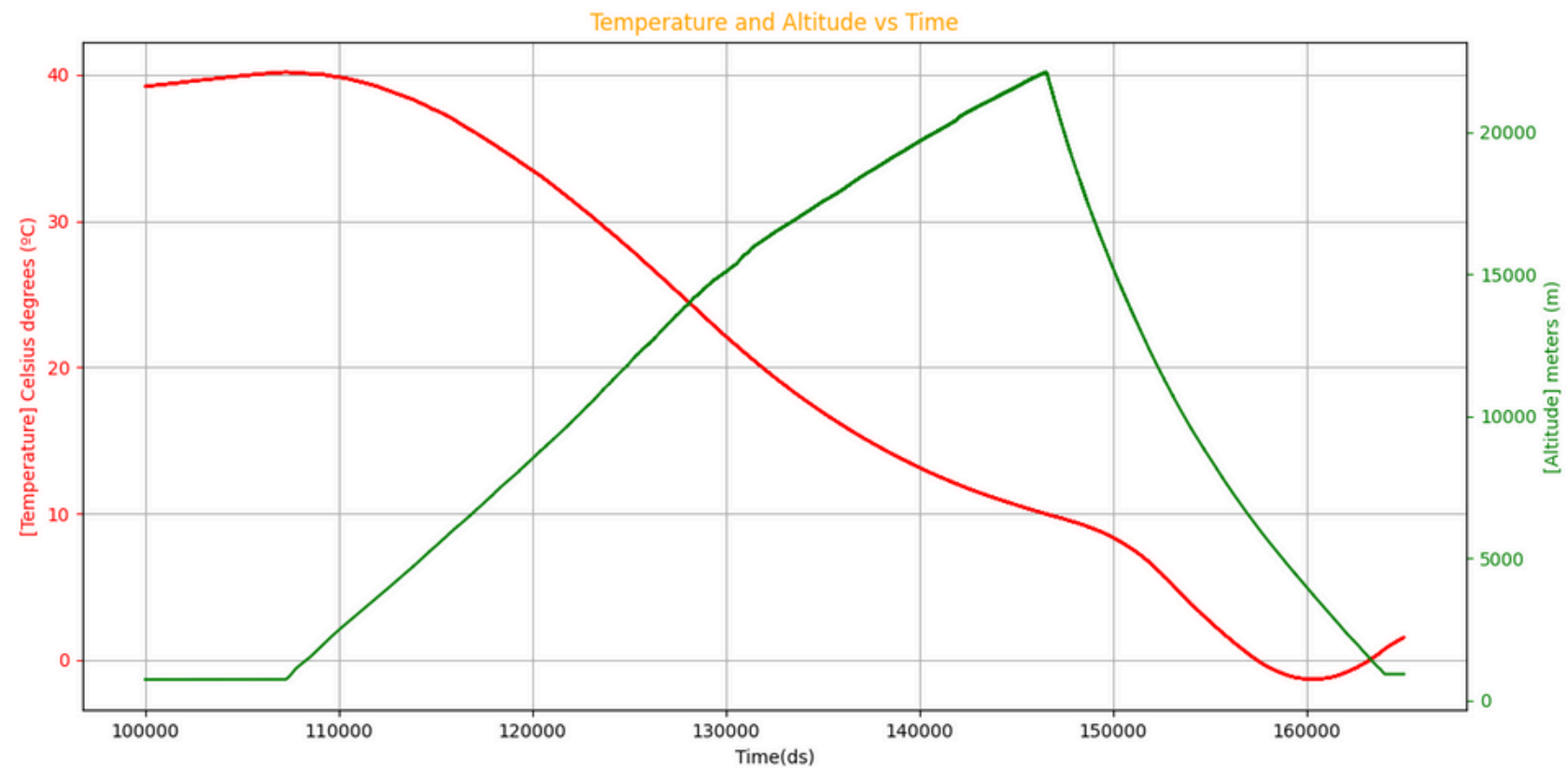
gyro\_x  
gyro\_y  
gyro\_z

mag\_x  
mag\_y  
mag\_z

 python™  
 Mahony Filter

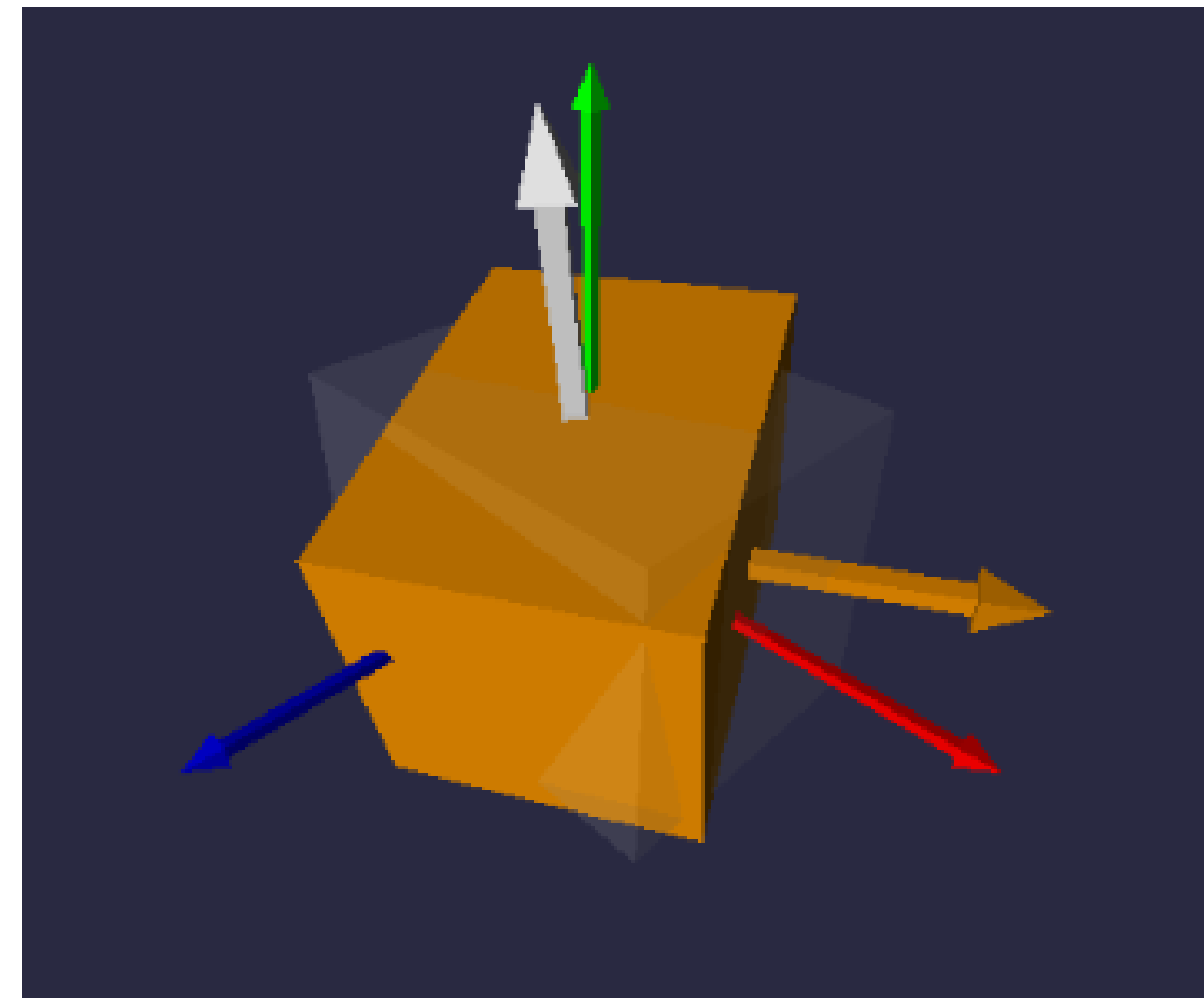


# Gráficas

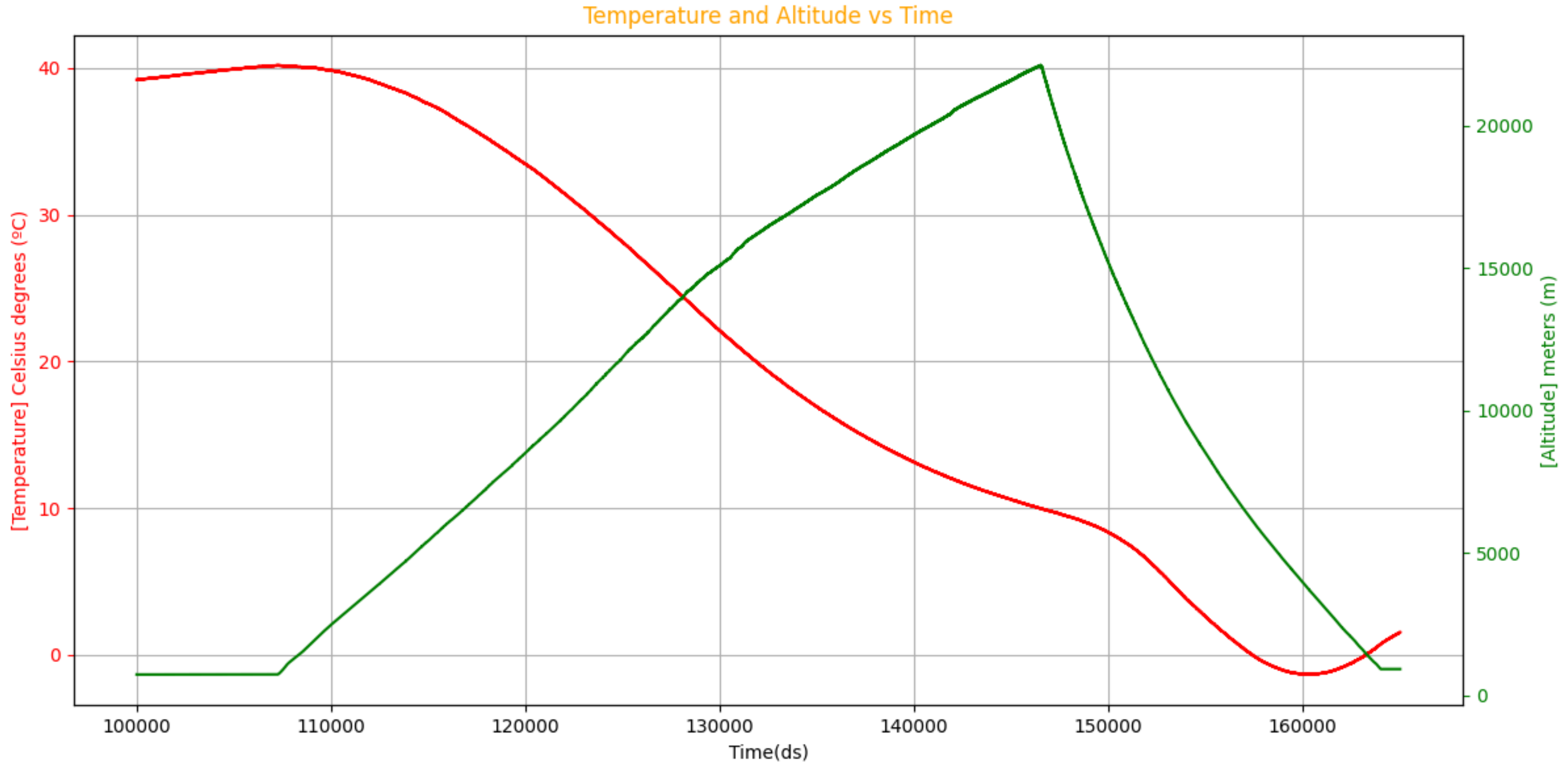
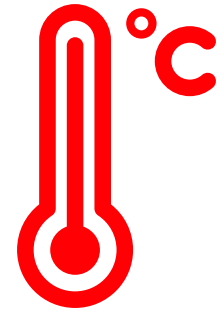


# Simulación 3D

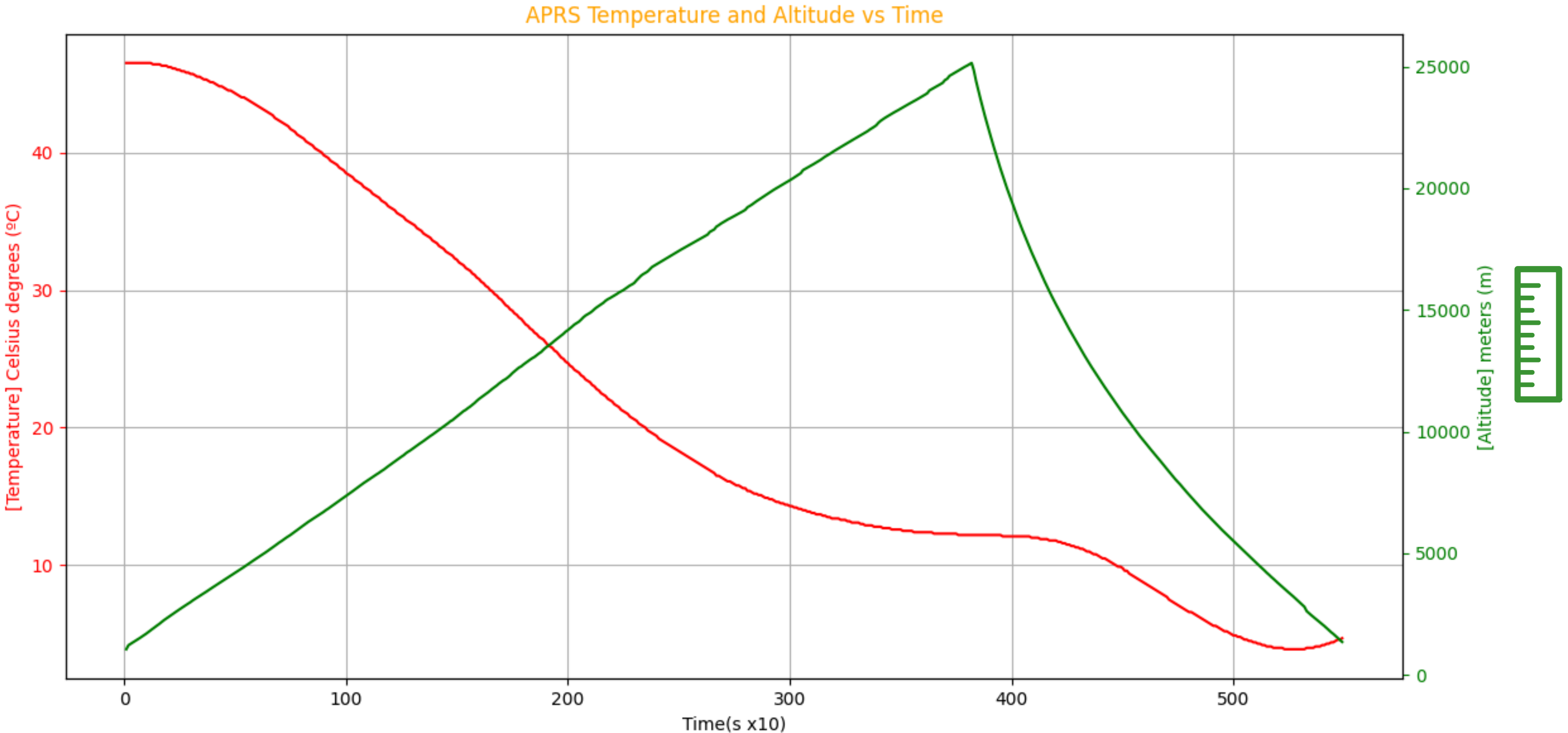
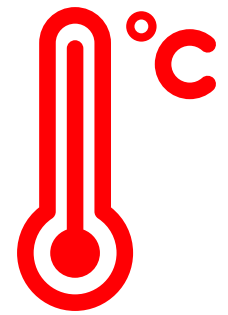
vpython/**glowscript**



# BME280: Temperatura Int y Altitud vs Tiempo

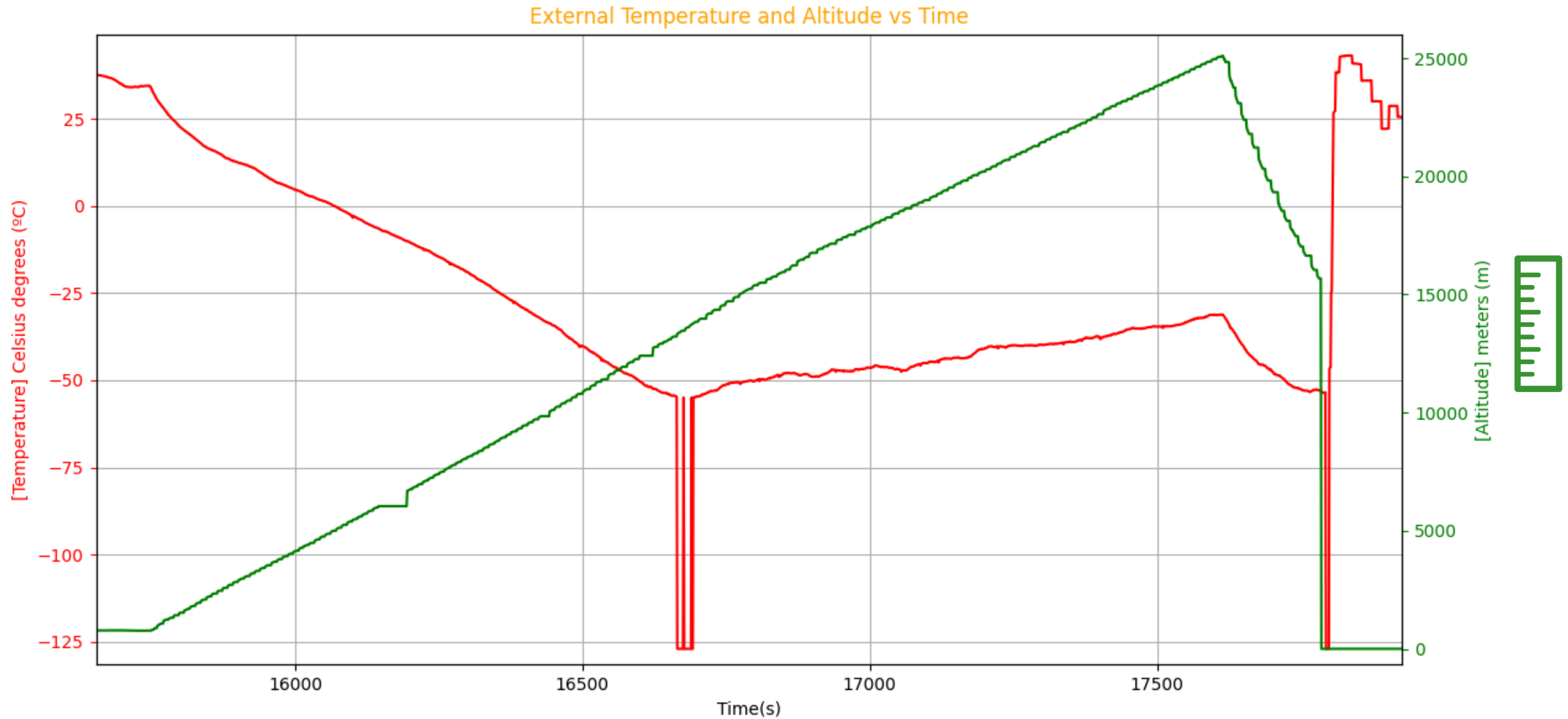
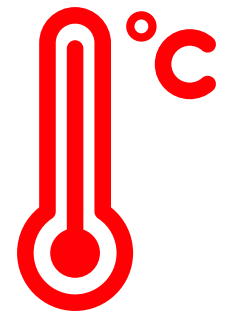


# APRS: Temperatura Int y Altitud vs Tiempo

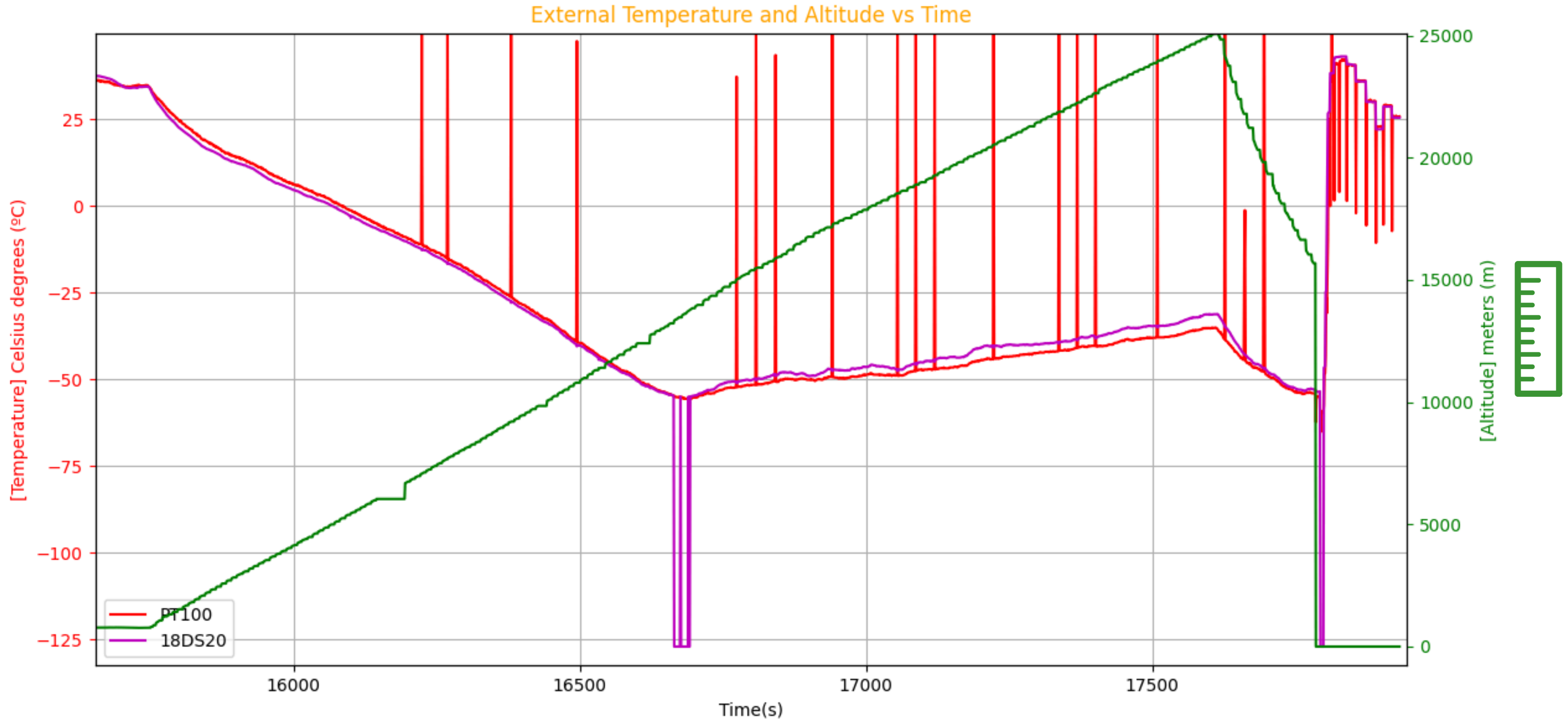
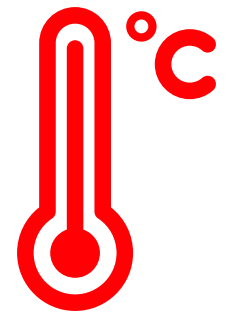




# 18DS20: Temperatura Ext y Altitud vs Tiempo

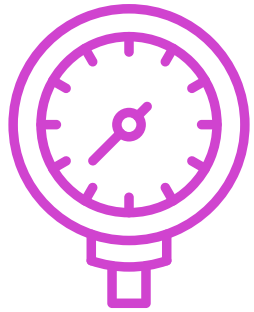
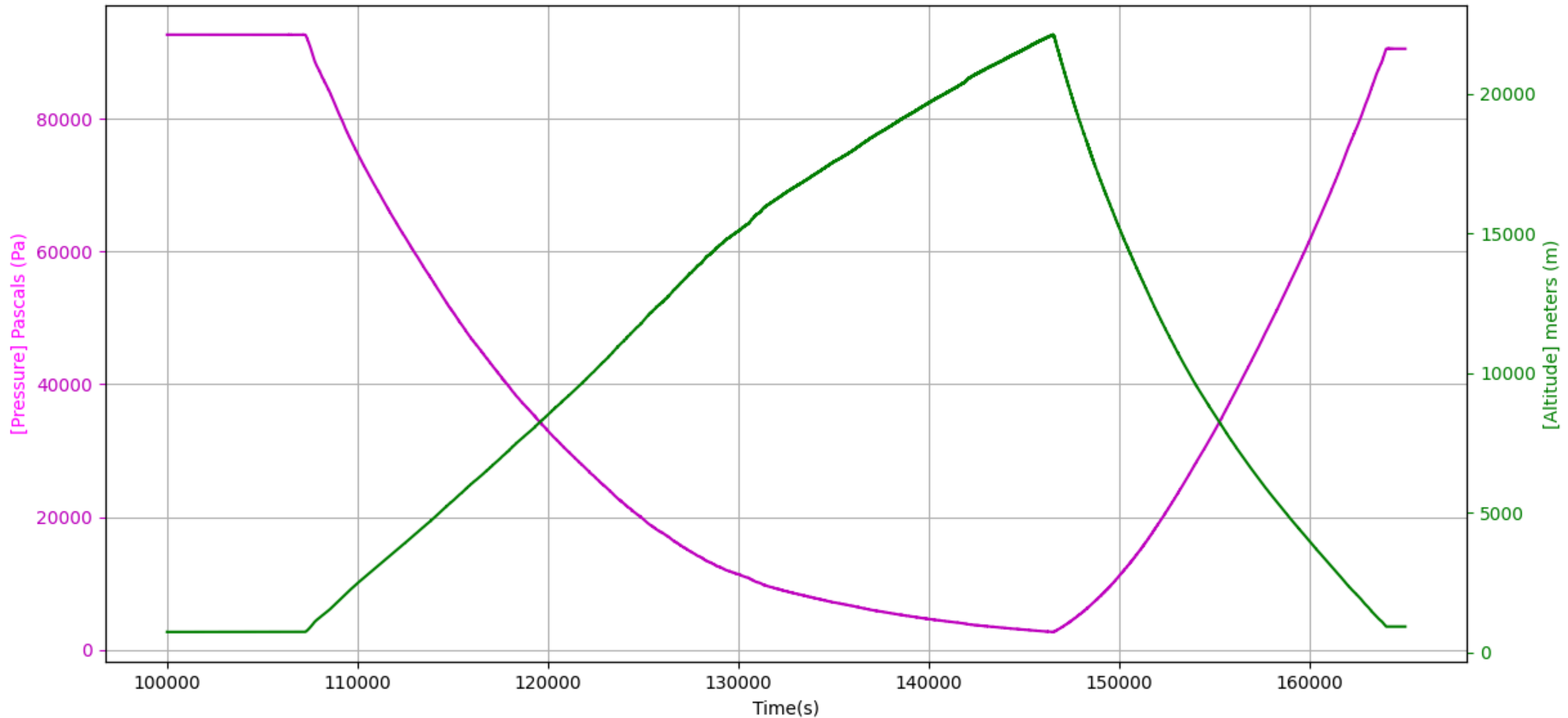


# Temperatura Ext: PT100 vs 18DS20

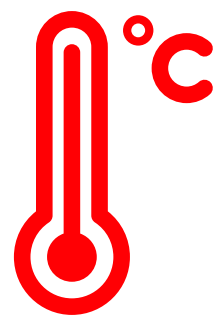
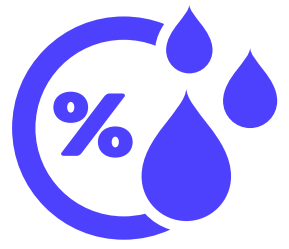
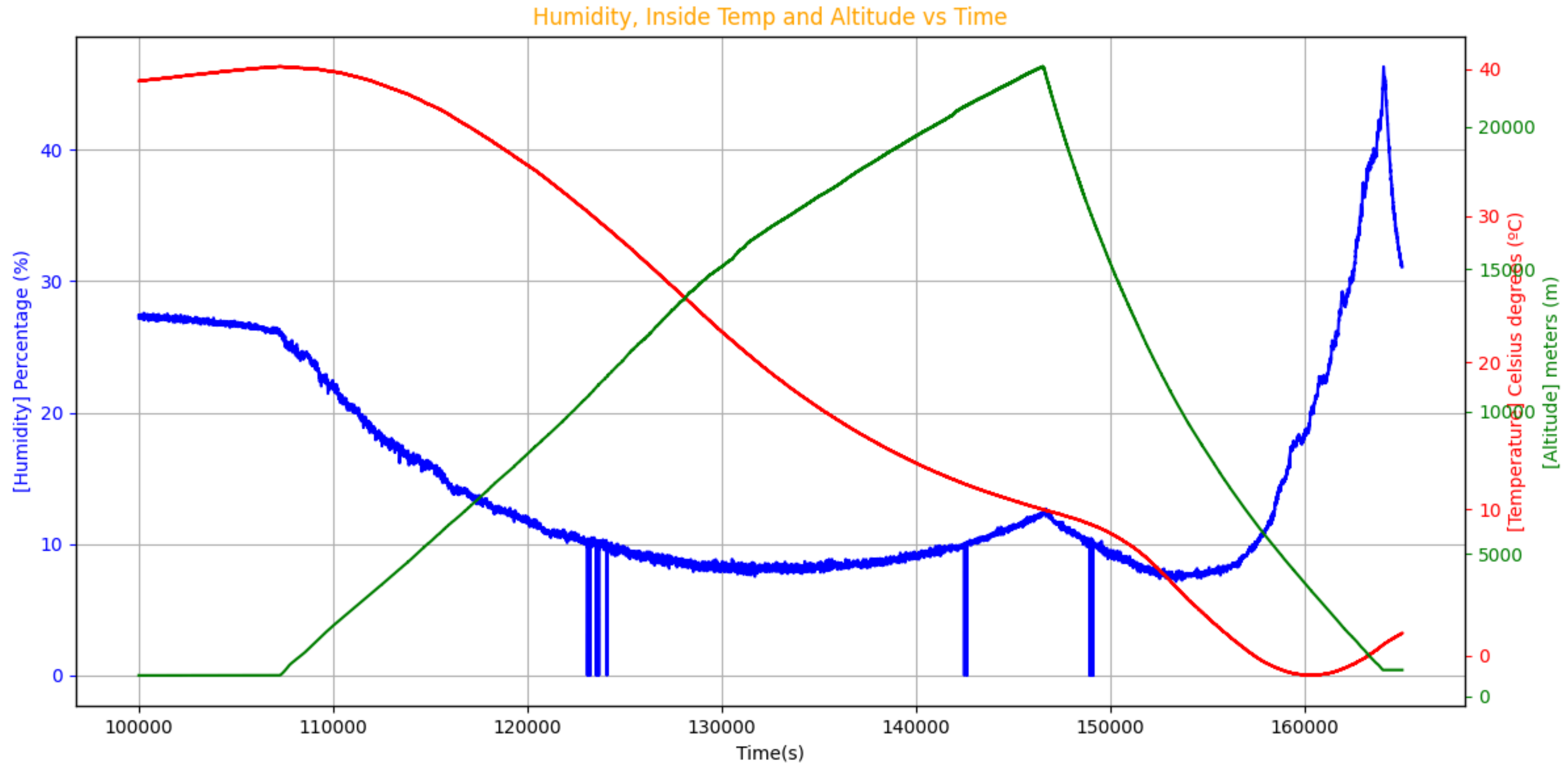


# BME280: Presión y Altitud vs Tiempo

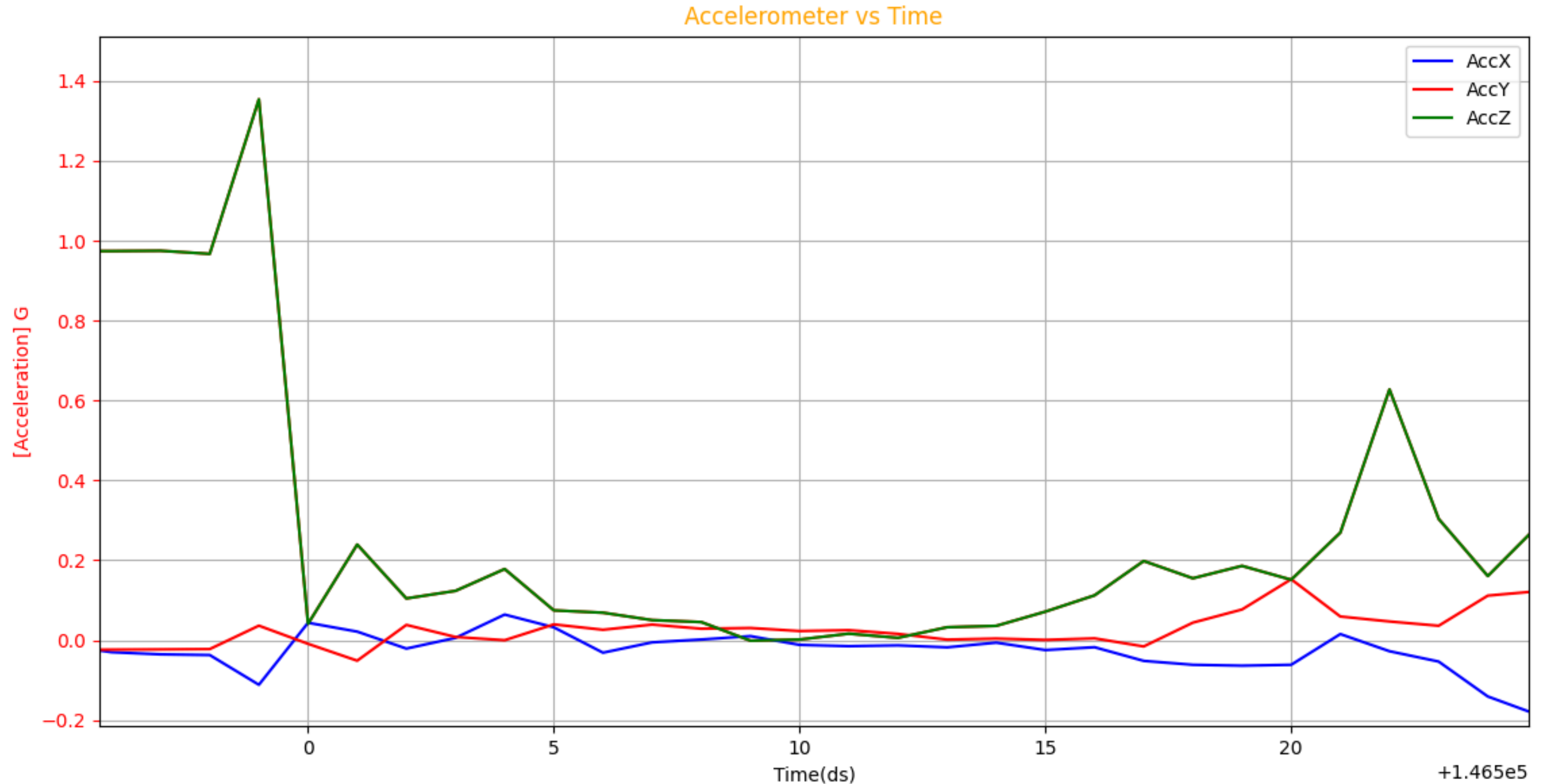
Pressure and Altitude vs Time



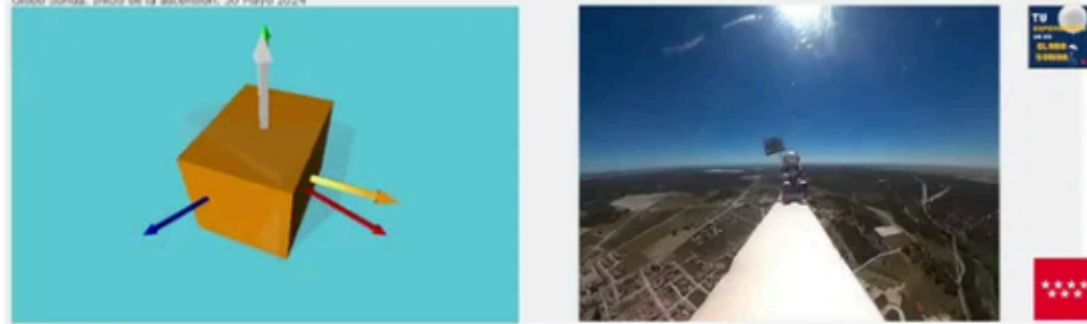
# BME280: Humedad rel y Temp Int vs Tiempo



# Microgravedad: Acelerómetro vs Tiempo



# Simulaciones 3D + Video Cámara



Globo Sonda. Inicio de la ascensión. 30 Mayo 2024

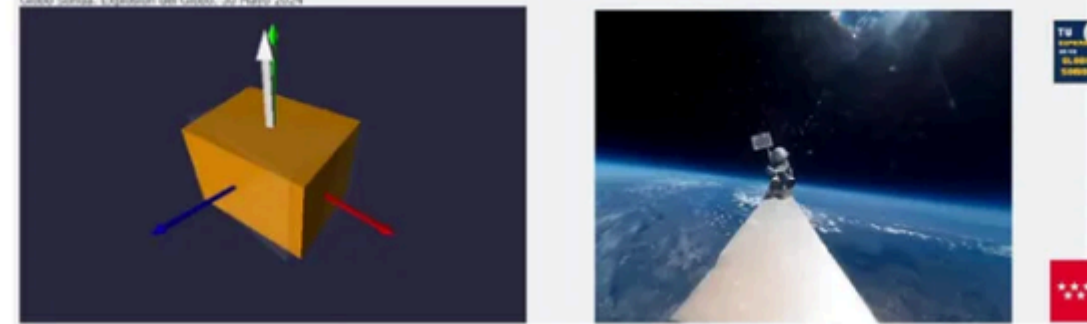
Altitude vs Time

Accelerometer vs Time

**Globo Sonda 2024. Inicio del ascenso. Coca (Segovia) | Mediateca de EducaMadrid**

Globo Sonda 2024. Inicio del ascenso. Coca (Segovia)

madrid.org



Globo Sonda. Explosión del Globo. 30 Mayo 2024


Altitude vs Time

Accelerometer vs Time

**Globo Sonda 2024. Microgravedad: Rotura Globo. Coca (Segovia). | Mediateca de EducaMadrid**

Globo Sonda 2024. Microgravedad: Rotura Globo. Coca (Segovia).

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Globo Sonda. Descenso. 30 Mayo 2024

**Descenso y aterrizaje Cabañas de Polendos (Segovia) 30 Mayo 2024**

ISABEL LA CATÓLICA

Altitude vs Time

Accelerometer vs Time

**Globo Sonda 2024. Aterrizaje. Cabañas de Polendos (Segovia). - Contenido educativo | Mediateca de...**

Globo Sonda 2024. Aterrizaje. Cabañas de Polendos (Segovia). - Contenido educativo

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Inicio  
Ascensión

Apogeo  
Rotura Globo

Descenso  
Aterrizaje

<https://mediateca.educa.madrid.org/video/xow4y7aqxkd5wxb6?jwsourc=cl>

<https://mediateca.educa.madrid.org/video/82z5d79birziiaak?jwsourc=cl>

<https://mediateca.educa.madrid.org/video/xow4y7aqxkd5wxb6?jwsourc=cl>

