



Helium sensitivity in STIM products

04.11.2020 – Hans Erik Mathisen

Introduction

- The gyros in Sensoror's STIM-products are sensitive to Helium
- In certain applications, exposure to Helium is unavoidable or may incidentally occur
- This report summarizes a characterization performed to study the gyros' response to exposure of 40ppm Helium over a 7 days period
- The elevated Helium concentration was achieved by applying normal air at 800kPa (absolute). Measurement sequence:
 - 2 hours at 100kPa (atmospheric pressure)
 - 7 days at 800kPa
 - 16 hours at 100kPa (atmospheric pressure)
- Pre and post characterization of bias (rate) and scale factor have been performed and drift analysis performed

Summary

- Gyro Bias:
 - Median shift of bias was $+157^{\circ}/h$ over the 7 days of exposure
 - Worst case shift was $1\ 277^{\circ}/h$
- Gyro Scale factor:
 - A negative shift was seen on all gyros, which is expected
 - Average shift was $-6\ 919\text{ppm}$, $1\ \text{sigma} = 1\ 712\text{ppm}$
 - Worst case scale-factor was 0.988542 ($-11\ 458\text{ppm}$ error)