

os3500 Temperature Compensation Summary

Test Start Date: April 23, 2015

Test End Date: April 27, 2015

Sensors tested: DEV009
DEV010
DEV011
DEV012

Test Equipment: Chamber: Espec SH-240
Interrogator: sm125 SIAB8T

Test Description:

Each of the 4 sensors was mounted with Bolt-on Brackets to an AISI 1018 Steel Plate measuring 8"x2"x3/8". The sensors were placed in Espec chamber which was programmed to ramp from -40°C to 50°C at a rate of 1/8°C/minute with a 1 hour dwell at -40°C and 50°C. A total of 3 cycles were performed.

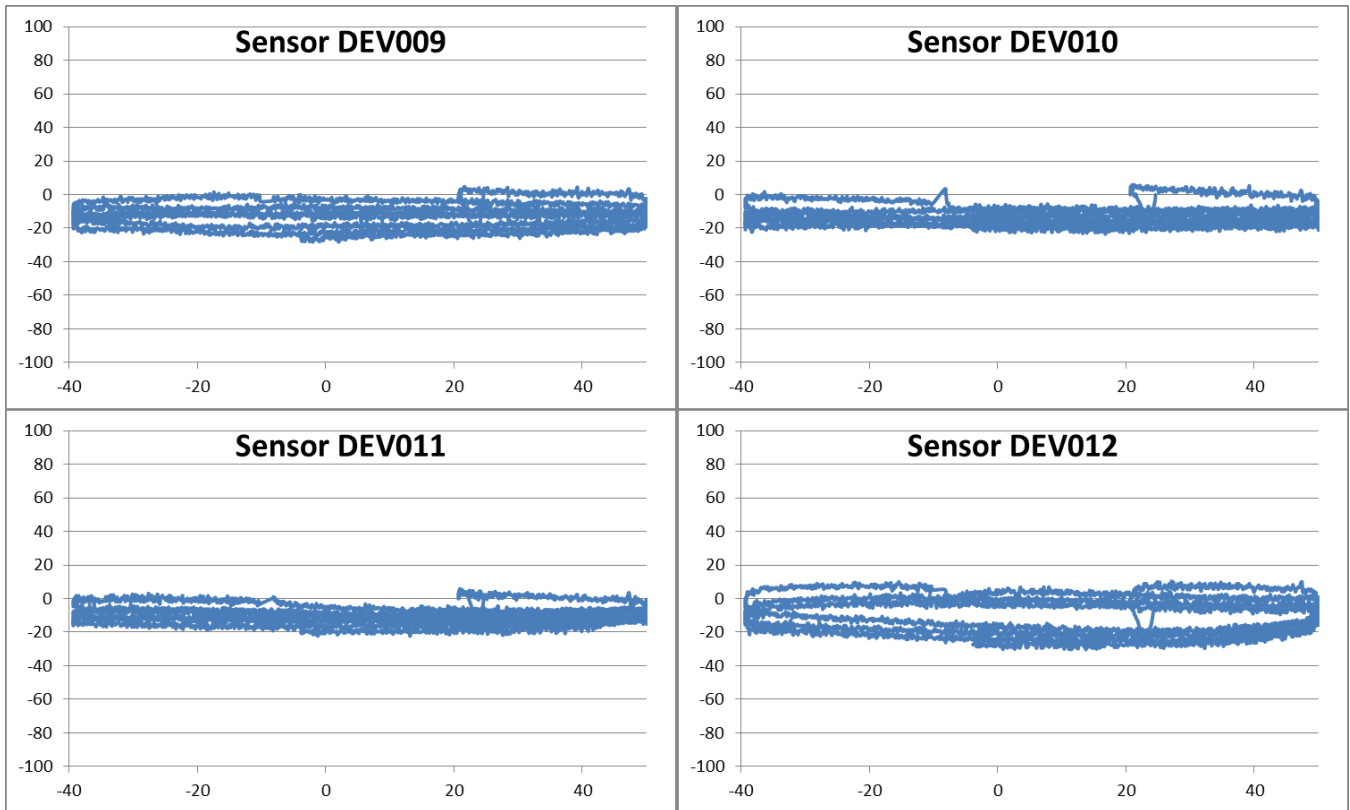
Using the following equation to calculate mechanical strain:

$$\varepsilon_{Mech} = 10^6 \left[\frac{(\Delta\lambda/\lambda_0)_S - (\Delta\lambda/\lambda_0)_T}{F_G} \right] + \frac{(\Delta\lambda/\lambda_0)_T}{S_T} (CTE_T - CTE_S)$$

Where:

$(\Delta\lambda/\lambda_0)_S$: Strain FBG response
 $(\Delta\lambda/\lambda_0)_T$: Temperature FBG response
 F_G : .81
 S_T : 0.0000135
 CTE_T : 11
 CTE_S : 13.1

The mechanical strain response of each sensor is plotted against temperature below:



Test Summary:

In this test, all 4 sensors give a reasonably flat response around zero.