Characterization

Temperature and Radiation

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The power of small things

Characterizations for sensor: 1614

TEMPERATURE CHARACTERIZATION

The temperature characterization is conducted using the temperature system CTS T-40/50 at the company facilities. Each sample is exposed at a temperature drift from 10ºC to 75ºC during one hour with measures every second. The data collected during the temperature steps is processed and extracted the lineal regression equation. The regression equation permits to compensate the sensor output against the reference output and eliminate most of the temperature effect on the sensor readout.

Temperature readout (digits)	Sensor Frequency Output (Hz) - y	Reference Frequency Output (Hz) - x
108	43420	42472
128	43488	42580
143	43604	42720

Lineal regression equation: y = mx + b

m: 1,31 b: -13962

Temperature Offset: 87

RADIATION CHARACTERIZATION

Characterization

Temperature and Radiation

The radiation characterization is carried out using the 60-Co source of the Radiation Physics Laboratory at the University of Santiago de Compostela (USC). The radiation procedure consists of a non-biased irradiation of the sample at 30 rad(Si)/h dose rate for an accumulated Total Ionizing Dose (TID) of rad(Si). The measures are carried out before and after the irradiation at the company facilities. From the data collected it is extracted the sensitivity for each sensor.

Pre-irradiation sensor value (Hz) - pre*	Post-irradiation sensor value (Hz) - post*
323.537	-5981.71

Sensor sensitivity: s = (pre-post) / 15

s = 421 Hz/rad

* Temperature compensated

Characterization

Temperature and Radiation

Characterizations for sensor: **1615**

TEMPERATURE CHARACTERIZATION

The temperature characterization is conducted using the temperature system CTS T-40/50 at the company facilities. Each sample is exposed at a temperature drift from 10ºC to 75ºC during one hour with measures every second. The data collected during the temperature steps is processed and extracted the lineal regression equation. The regression equation permits to compensate the sensor output against the reference output and eliminate most of the temperature effect on the sensor readout.

Temperature readout (digits)	Sensor Frequency Output (Hz) - y	Reference Frequency Output (Hz) - x
108	42652	40532
128	42712	40612
143	42808	40748

Lineal regression equation: y = mx + b

m: 1,32 b: -14151

Temperature Offset: 87

RADIATION CHARACTERIZATION

The radiation characterization is carried out using the 60-Co source of the Radiation Physics Laboratory at the University of Santiago de Compostela (USC). The radiation procedure consists of a non-biased irradiation of the sample at 30 rad(Si)/h dose rate for an accumulated Total Ionizing Dose (TID) of rad(Si). The measures are carried out before and after the irradiation at the company facilities. From the data collected it is extracted the sensitivity for each sensor.

Pre-irradiation sensor value (Hz) - pre*	Post-irradiation sensor value (Hz) - post*
619.691	-5912

Sensor sensitivity: s = (pre-post) / 15

s = 436 Hz/rad

* Temperature compensated