Radiation tests @PSI 1-3 October 2005

AB/BDI/BL
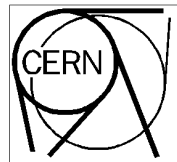
Beam on the current to frequency circuit Board 1

The irradiation was applied in 5 step of 100 Gry each.

after the stop of the beam, the card was initialized (reset of the compensation of the current).

then the card started to compensate the current due to the irradiation.
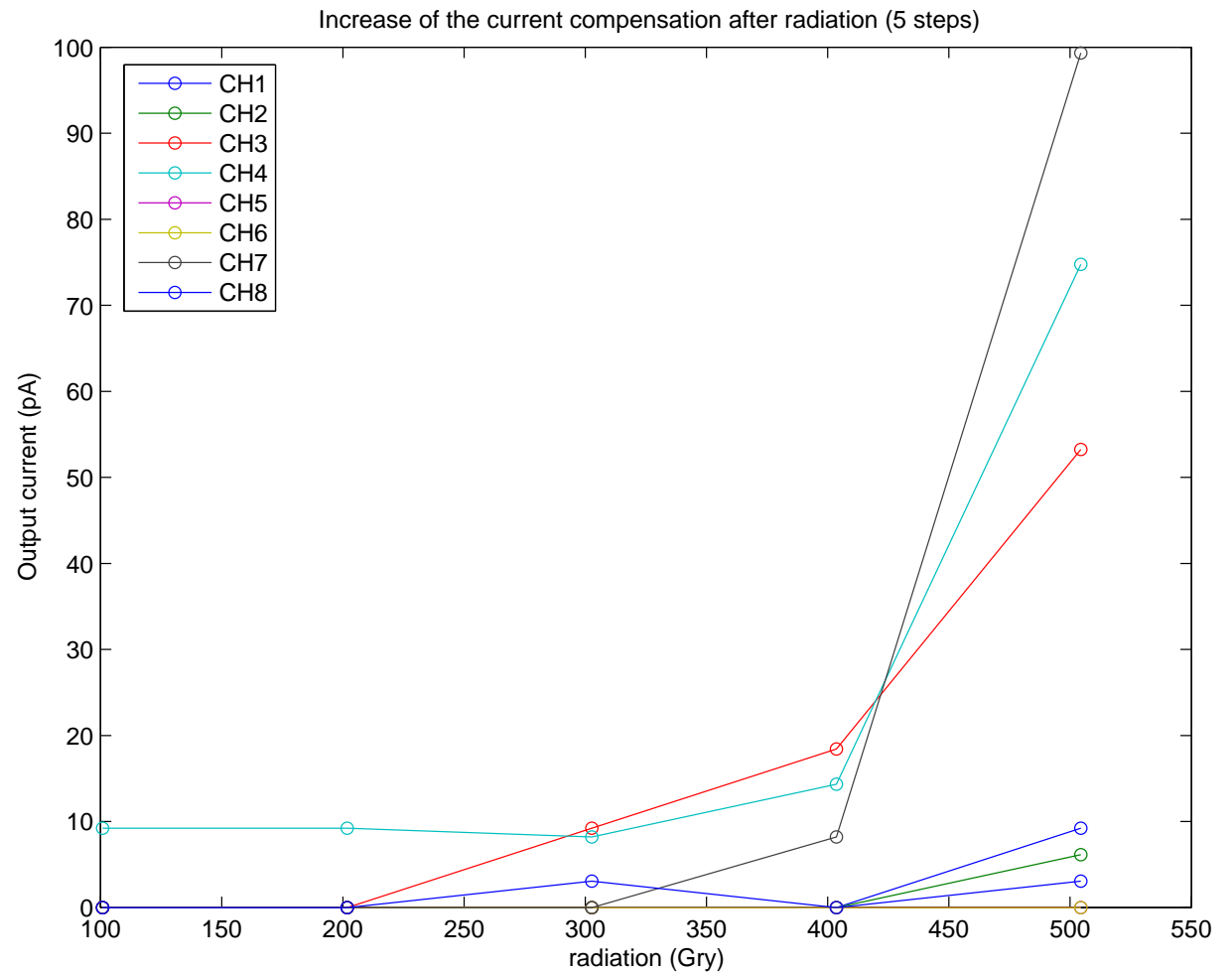
Increase of the current compensation after radiation (5 steps)
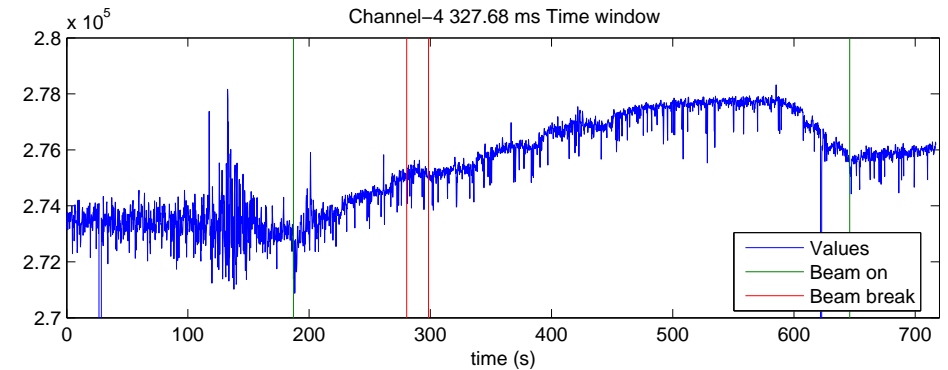
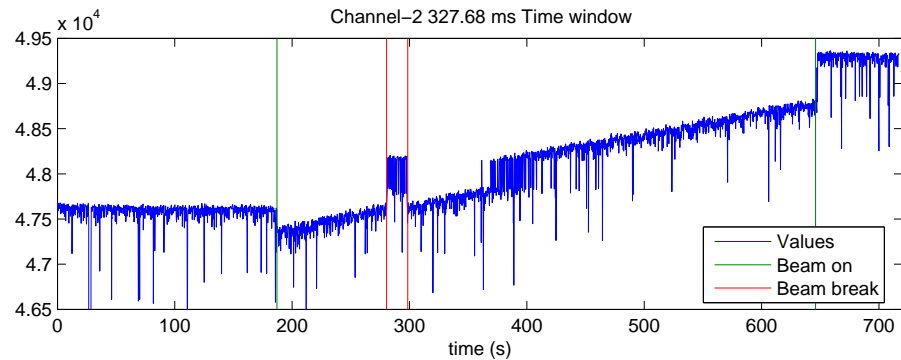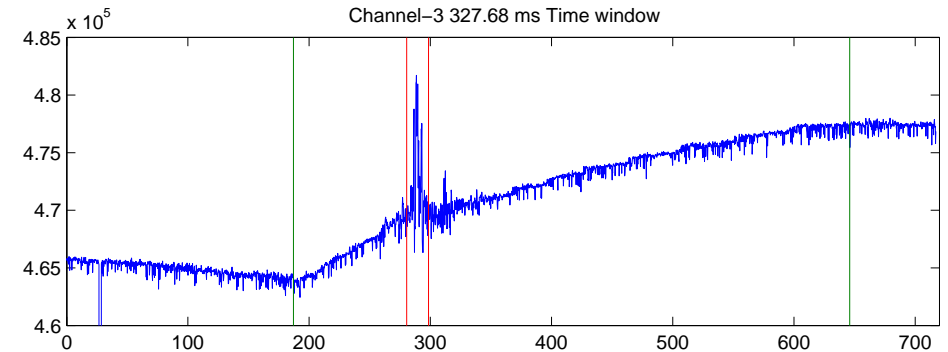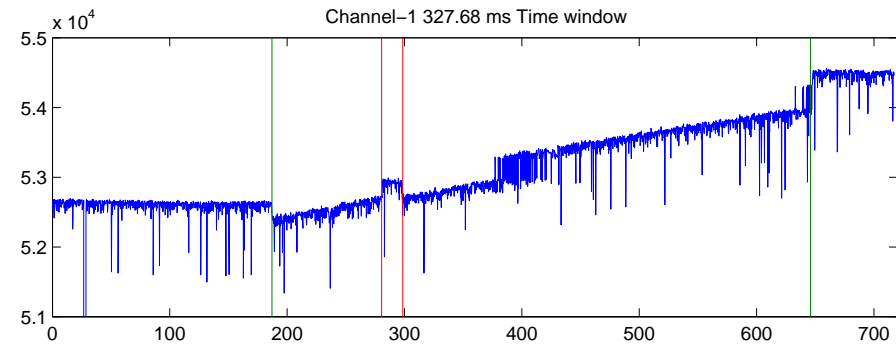# Beam on the current to frequency circuit, Board 1

Variation of the current when the beam goes on and off.

Channel 1 is displayed for different time windows.
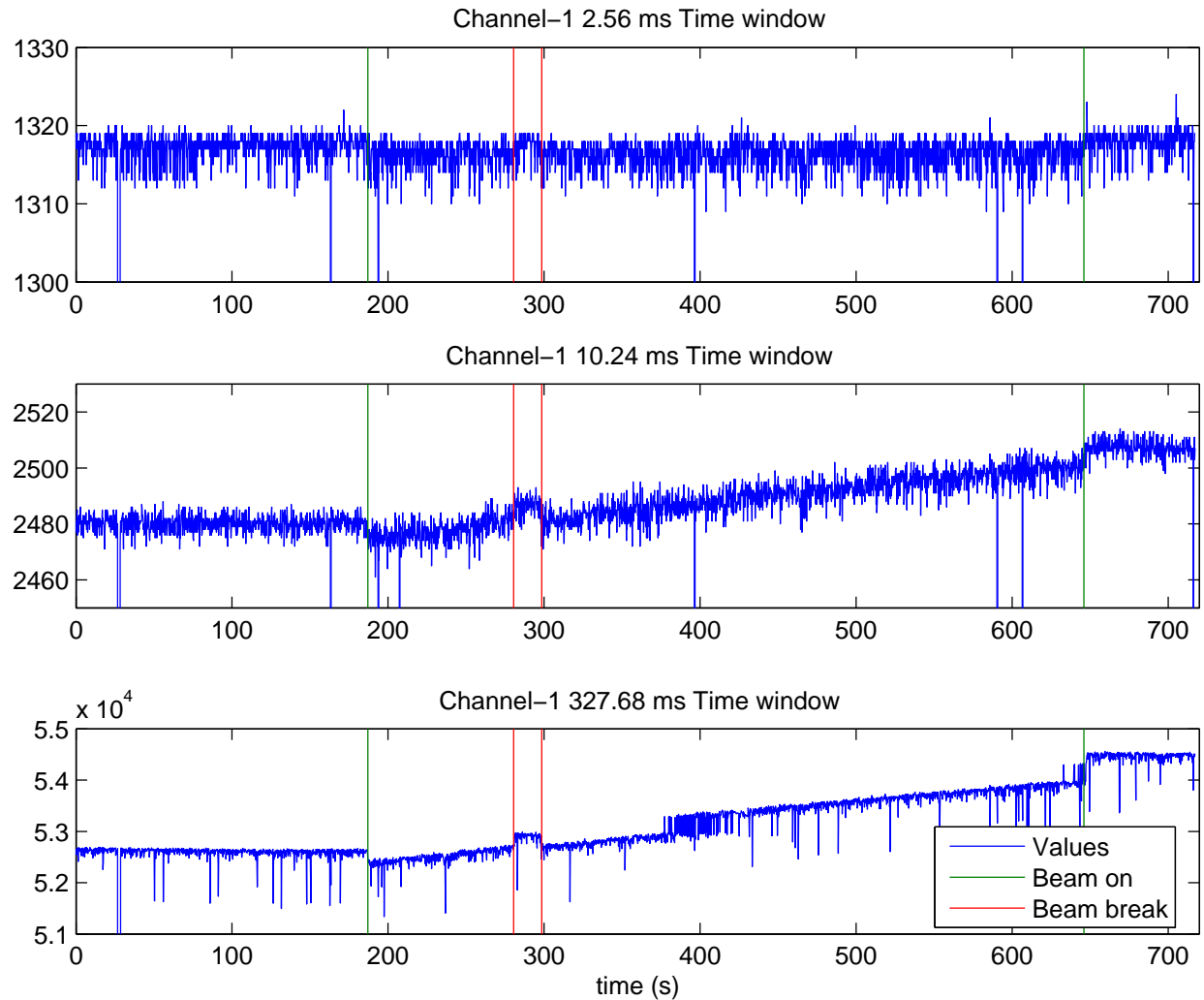
Beam on the current to frequency circuit, Board 1

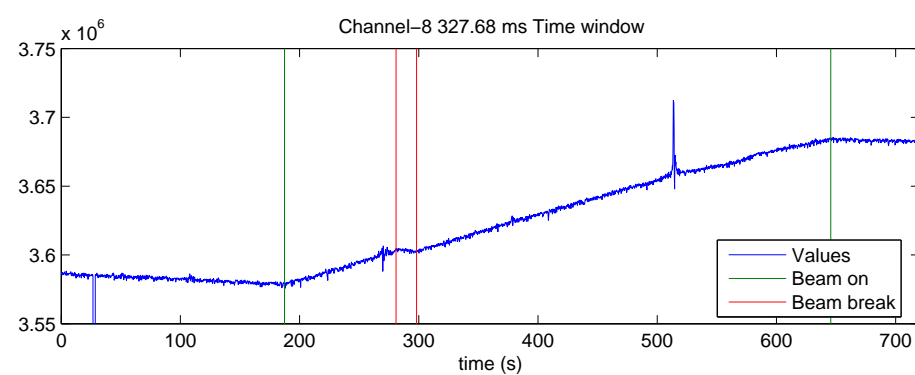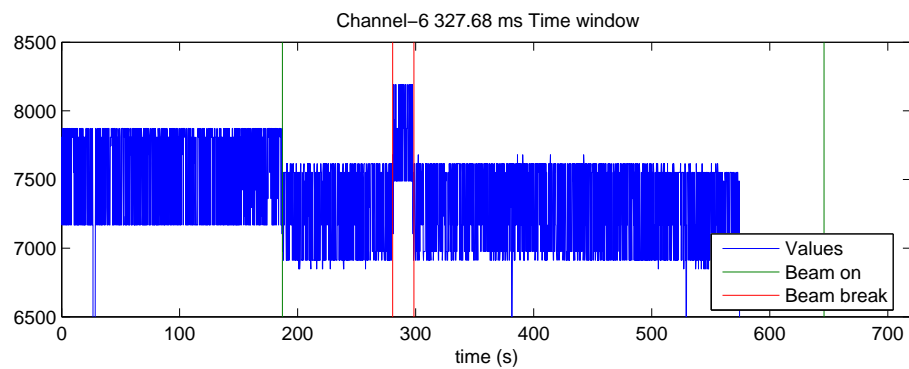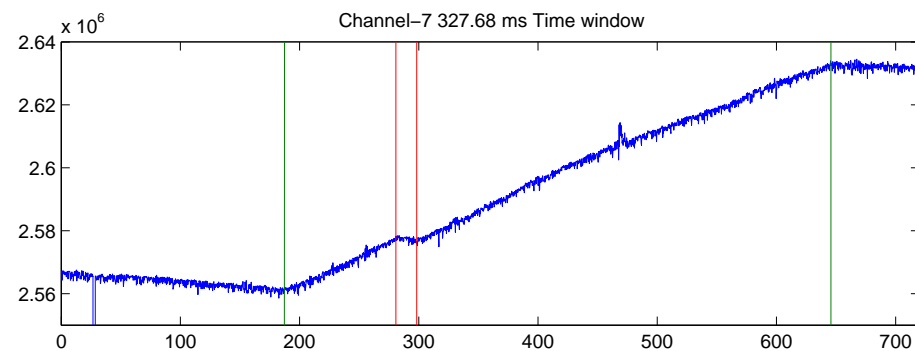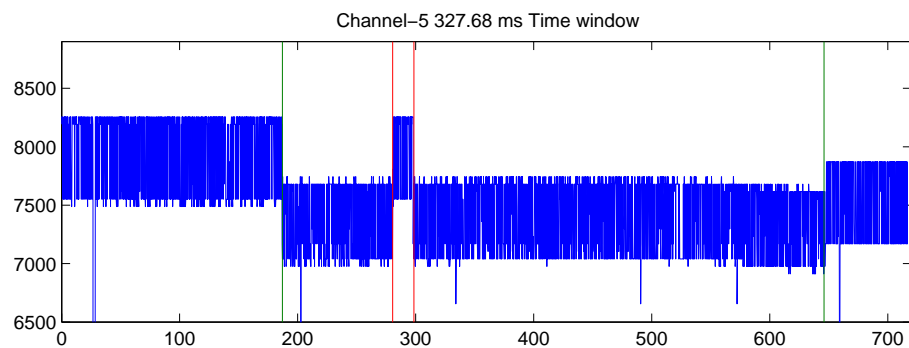Variation of the current when the beam goes on and off.
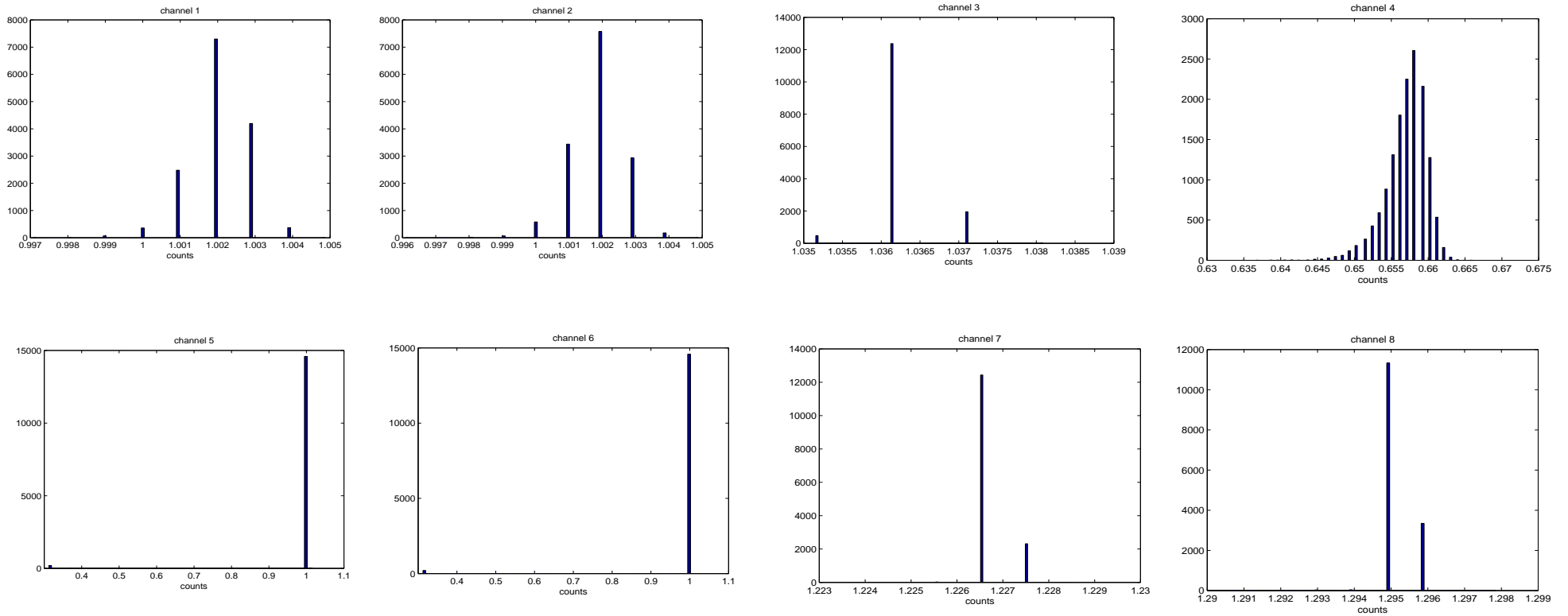
Beam on the current to frequency circuit, Board 1

Variation of the current when the beam goes on and off.
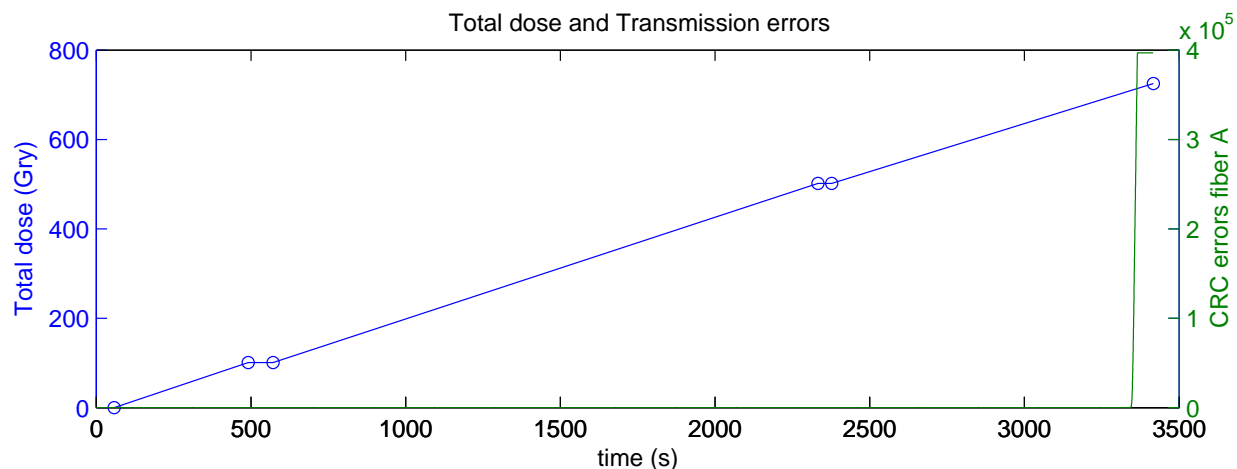
Beam on the FPGA No 1, SEU check

Histogram of the 8 outputs of the "maximum of the running sums", 40µs.
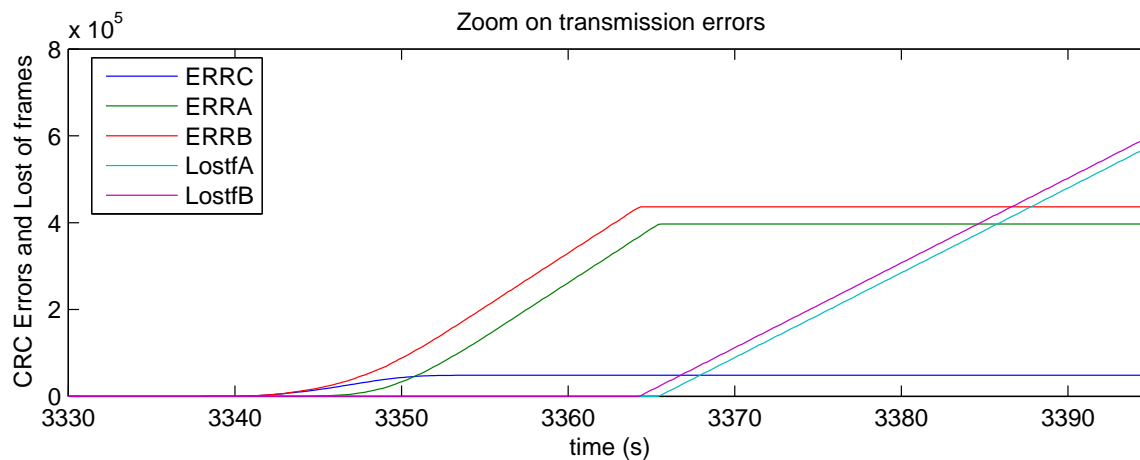

In case of SEU, the results would show a dispersion in the whole range (0 to 200 counts).

Beam on the FPGA No 1, SEU & transmission errors check

The card didn't send any corrupted frame until 700 Gry.

Total dose and Transmission errors

(plot: Total dose (Gry) vs time (s), with right axis CRC errors fiber A × 10⁵)

The errors stated on fiber channel, then the second soon after (5s). 20 seconds later the crc errors become lose of frames. (complete loss of the signal)

Zoom on transmission errors

(plot: CRC Errors and Lost of frames × 10⁵ vs time (s))

Legend:
- ERRC
- ERRA
- ERRB
- LostfA
- LostfB

Beam on the GOH1, FPGA No 2, SEU check

Histogram of the 8 outputs of the "maximum of the running sums", 40µs.
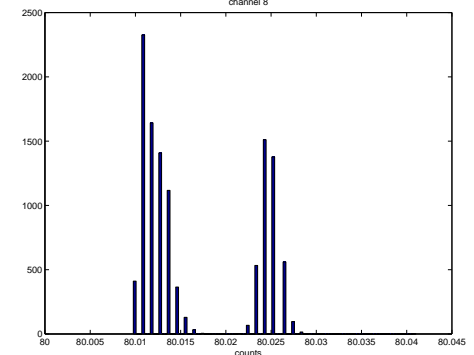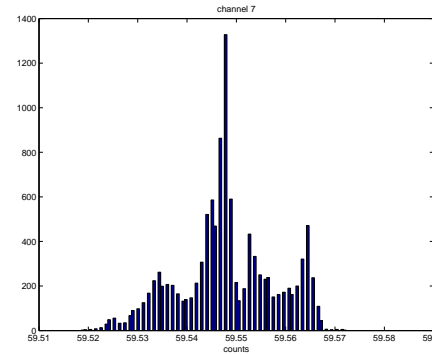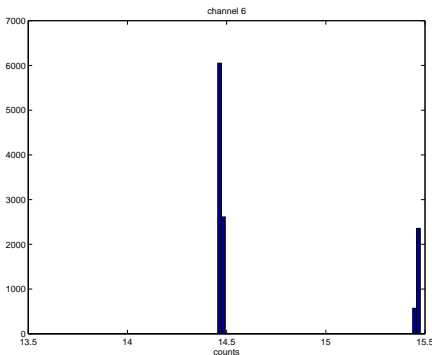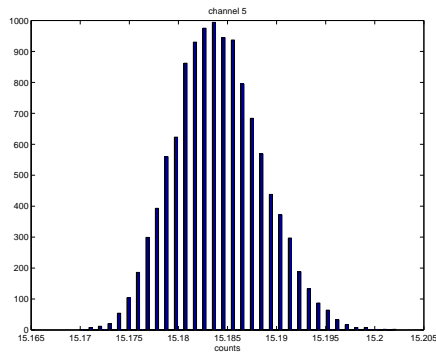
In case of SEU, the results would show a dispersion in the whole range (0 to 200 counts).

Beam on the GOH1, FPGA No 2, SEU & transmission errors check
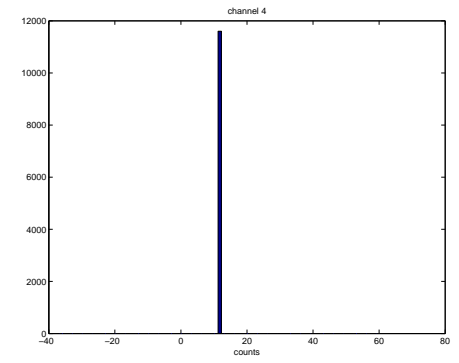
The GOH1 stopped working prematurely at 200 Gry.

Only the fiber A present significant errors.

Total dose and Transmission errors

Zoom on transmission errors

Beam on the FPGA No 3, SEU check

Histogram of the 8 outputs of the "maximum of the running sums", 40µs.

In case of SEU, the results would show a dispersion in the whole range (0 to 200 counts).

Beam on the FPGA No 3, Transmission errors
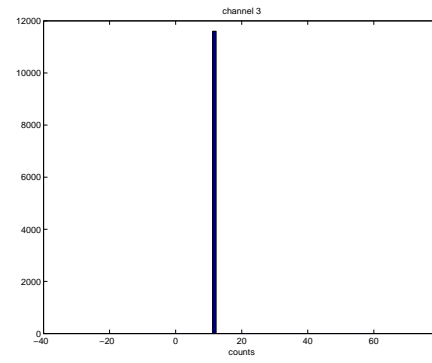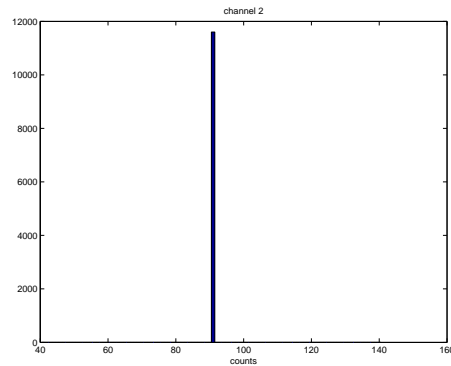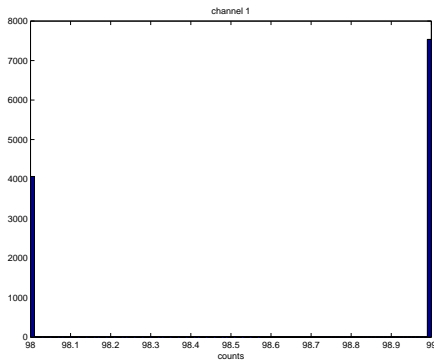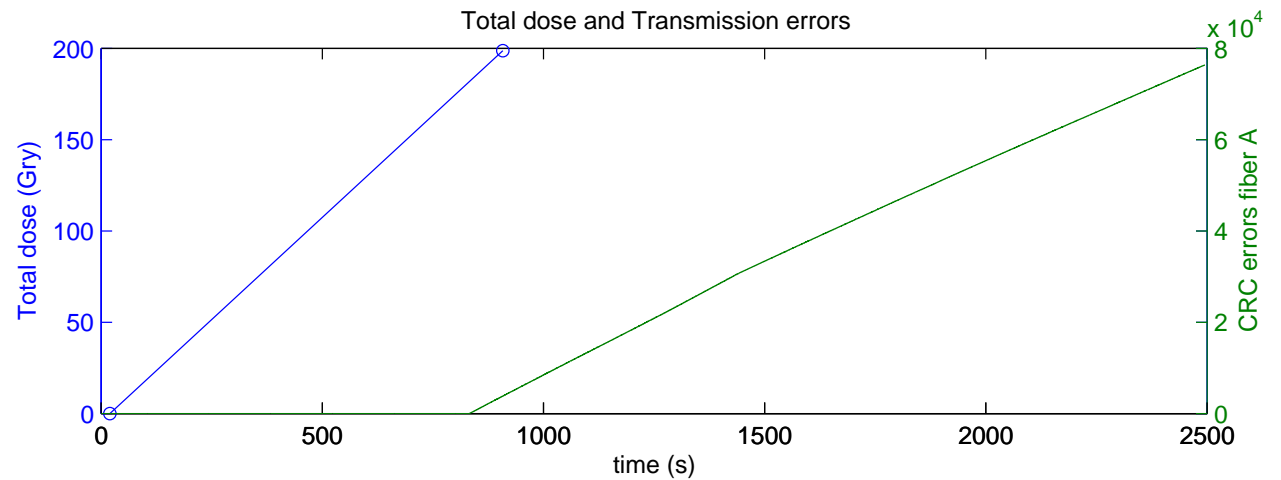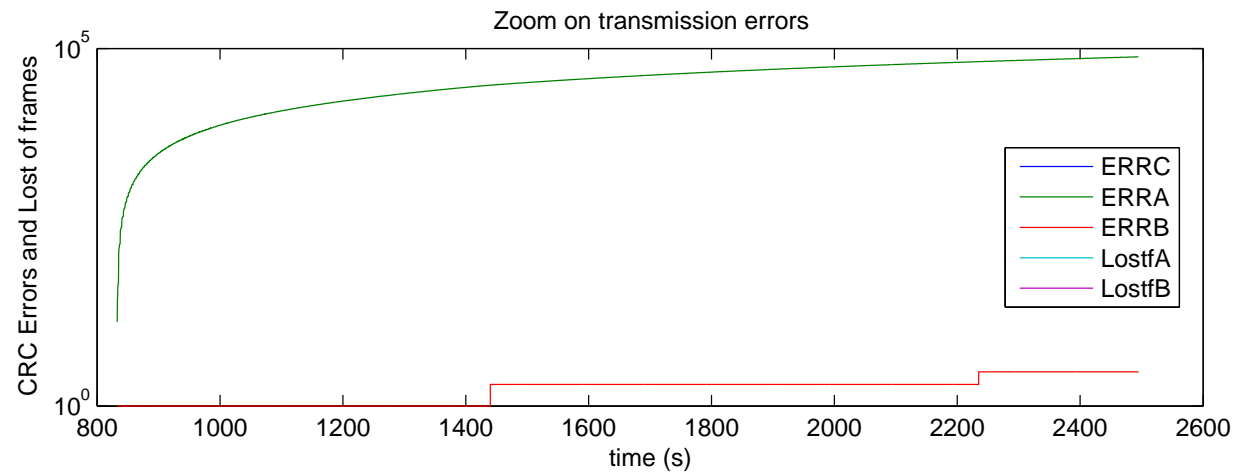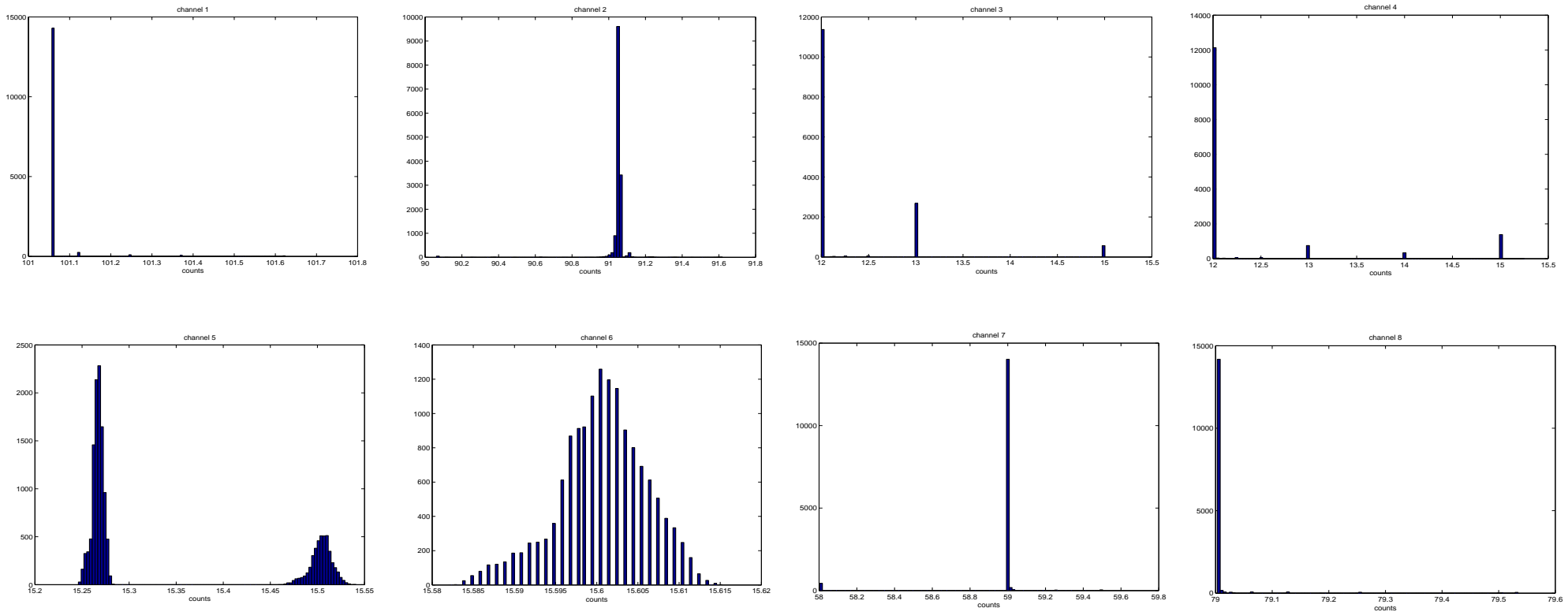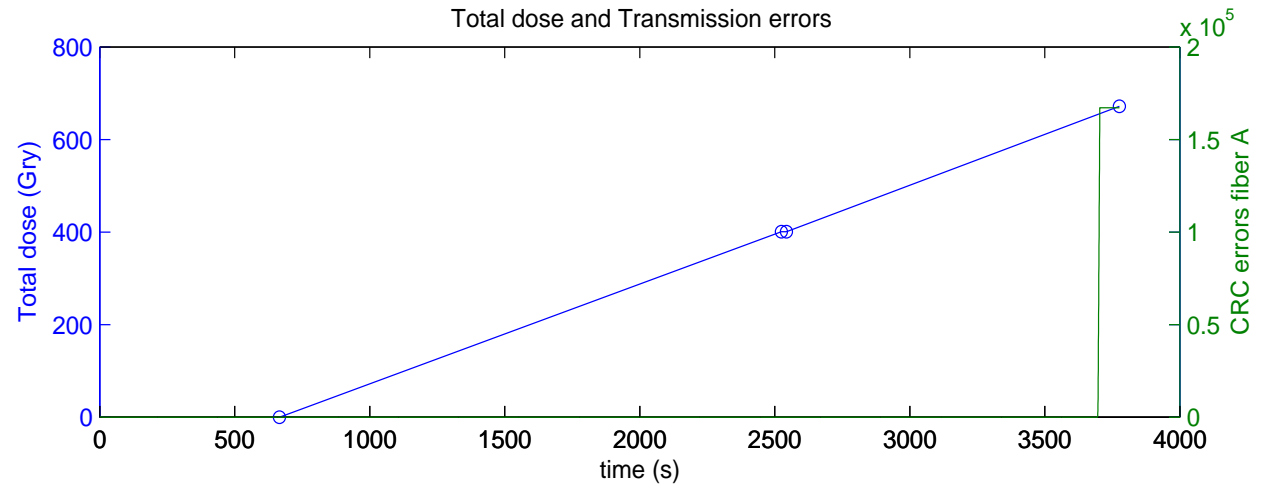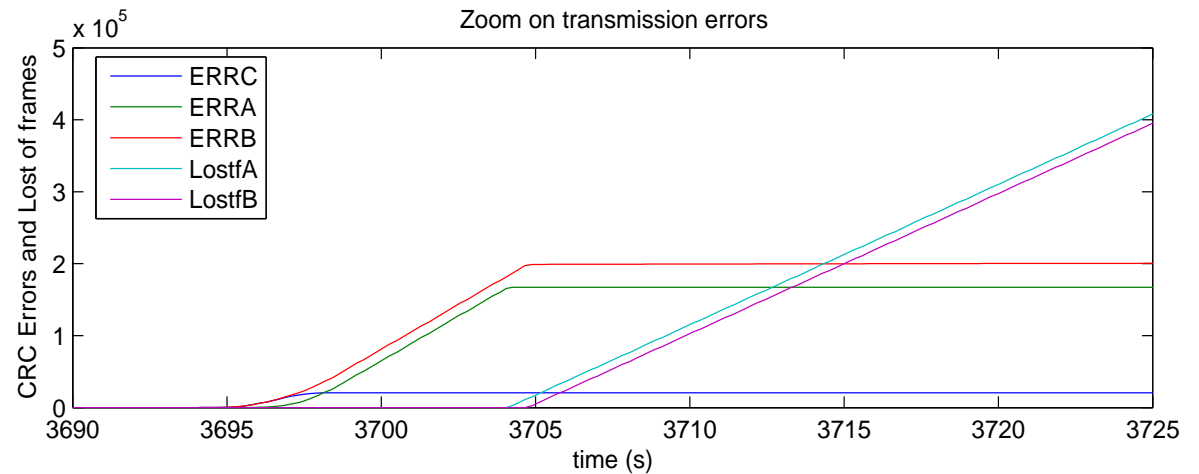
The card didn't send any Corrupted frame until 660 Gry.

The errors stated on fiber channel, then the second soon after (5s). 15 seconds later the crc errors become lose of frames. (complete loss of the signal)

Total dose and Transmission errors

Zoom on transmission errors

Power supply

The 5V power supply was irradiated at 2 different locations (around 500 Gry each).
1. Close to the connector
2. Other rest of the PWS

Soon after the beginning, the voltage increase to reach 5.9V.
@3000s change the position of the beam.

Total dose
Position 1: 440 Gry
Position 2: 500 Gry
          Out of work 380 Gry