XMM-Newton CCF Release Note

XMM-CCF-REL-68

RGS Offset Values as a Function of Time

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1 CCF components

Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
RGS1_ADUCONV_0006	2000-02-06T12:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS2_ADUCONV_0007	2000-02-06T12:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS1_ADUCONV_0007	2000-07-09T01:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS2_ADUCONV_0008	2000-07-09T01:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS1_ADUCONV_0008	2000-07-23T15:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS2_ADUCONV_0009	2000-07-23T15:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS1_ADUCONV_0009	2000-09-12T19:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS2_ADUCONV_0010	2000-09-12T19:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS1_ADUCONV_0010	2000-11-11T15:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS2_ADUCONV_0011	2000-11-11T15:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO
RGS2_ADUCONV_0012	2000-12-25T12:00:00	OFFSET_GAIN	xmmsas_20010403_1900	NO

2 Changes

The offset of the PHA conversion was changed from a constant value in time, to a parameterization, depending on observation date (`OBS_START`). Therefore the `OFFSET` column was replaced by the columns `OFFSET_CONST` and `OFFSET_SLOPE` and the attribute `REFTIME` was added. See [1, version 2.1] for a description of the functionality.

`ALGOID` = 1.

The analysis is described in [2].

3 Scientific Impact of this Update

The offset is used for the calculation of the PI values, which brings all CCD energy (through charge) measurements onto the same scale. The PI value is subsequently used for the order selection of the data, hence it influences the effective area.

Since the changes are only minor in PHA channels, the impact is too small to be measurable.

The slopes of the offset parameterization of the last period of validity were set = 0 in order to avoid incorrect results in the course of time.

4 Estimated Scientific Quality

The changes correspond to the following operational changes/effects on the instruments:

- a large solar flare in revolution 109
- due to a failure on the electronics of RGS1 CCD7, operations were suspended during revolutions 136–147
- the biases of all CCD's were lowered at the start of revolution 168, which also coincided with the first operations following another large solar flare
- at the start of revolution 192 the bias of RGS2 CCD2 was brought back to its original value

The measured offset values are shown in Figures 1–4 as a function of revolution number. The major events, which are listed above, are indicated by vertical dashed lines. The parameterizations are overlay-ed by red lines, per period.

References

[1] Christian Erd, Phillipe Gondoin, David Lumb, Rudi Much, Uwe Lammers, and Giuseppe Vacanti. *Calibration Access and Data Handbook*. XMM-PS-GM-20, issue 2.1, ESA/SSD, April 2001. http://xmm.vilspa.esa.es/calibration/docs/general/calhb.ps.gz.

[2] C. Gabriel. *XMM-Newton: RGS Diagnostic Trend Analysis Report*. XMM-SOC-INST-TN-0001, issue 2.0, XMM-Newton SOC, February 2001.

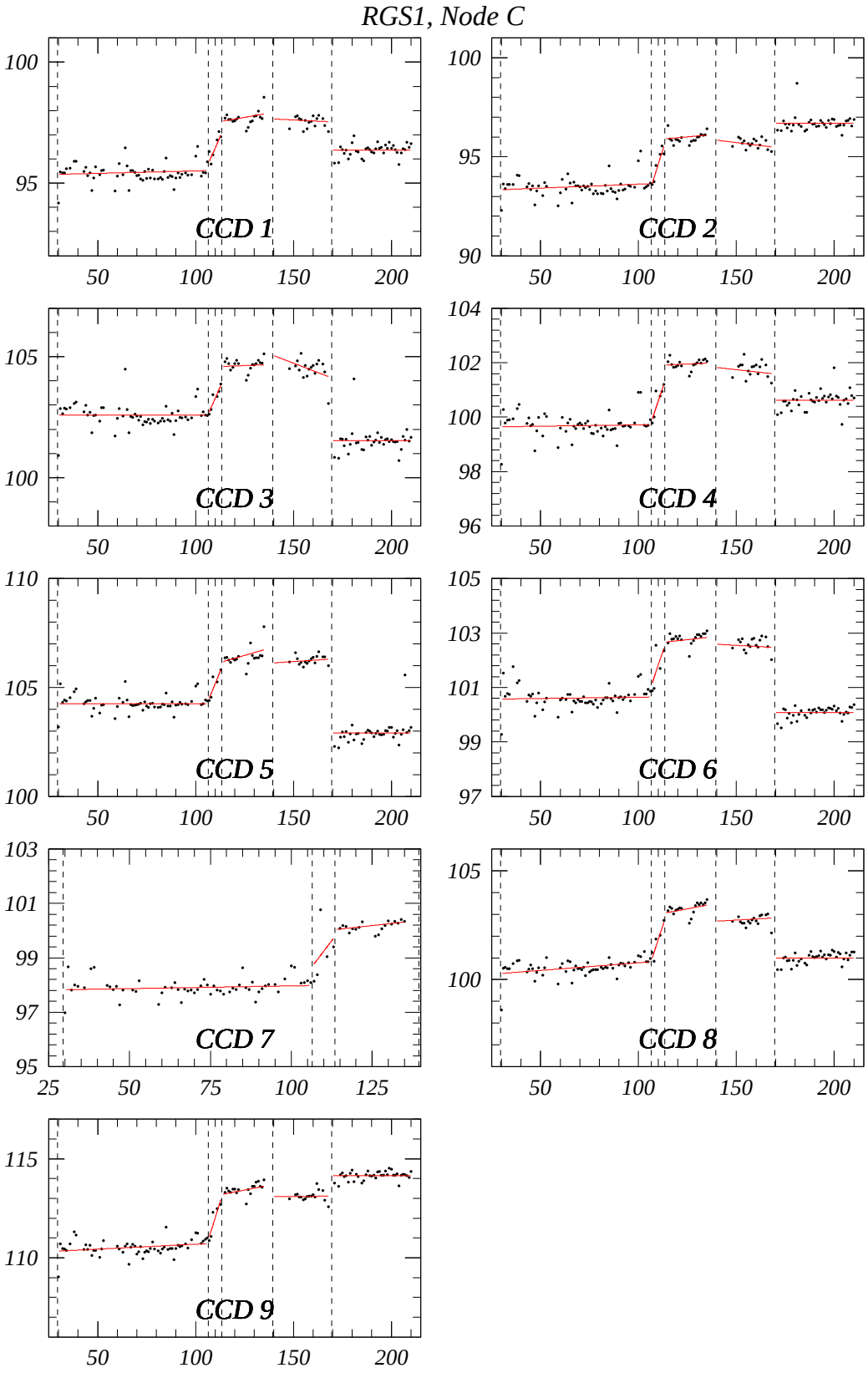

Figure 1: Offset values versus revolution number for RGS1, all CCD's nodes C

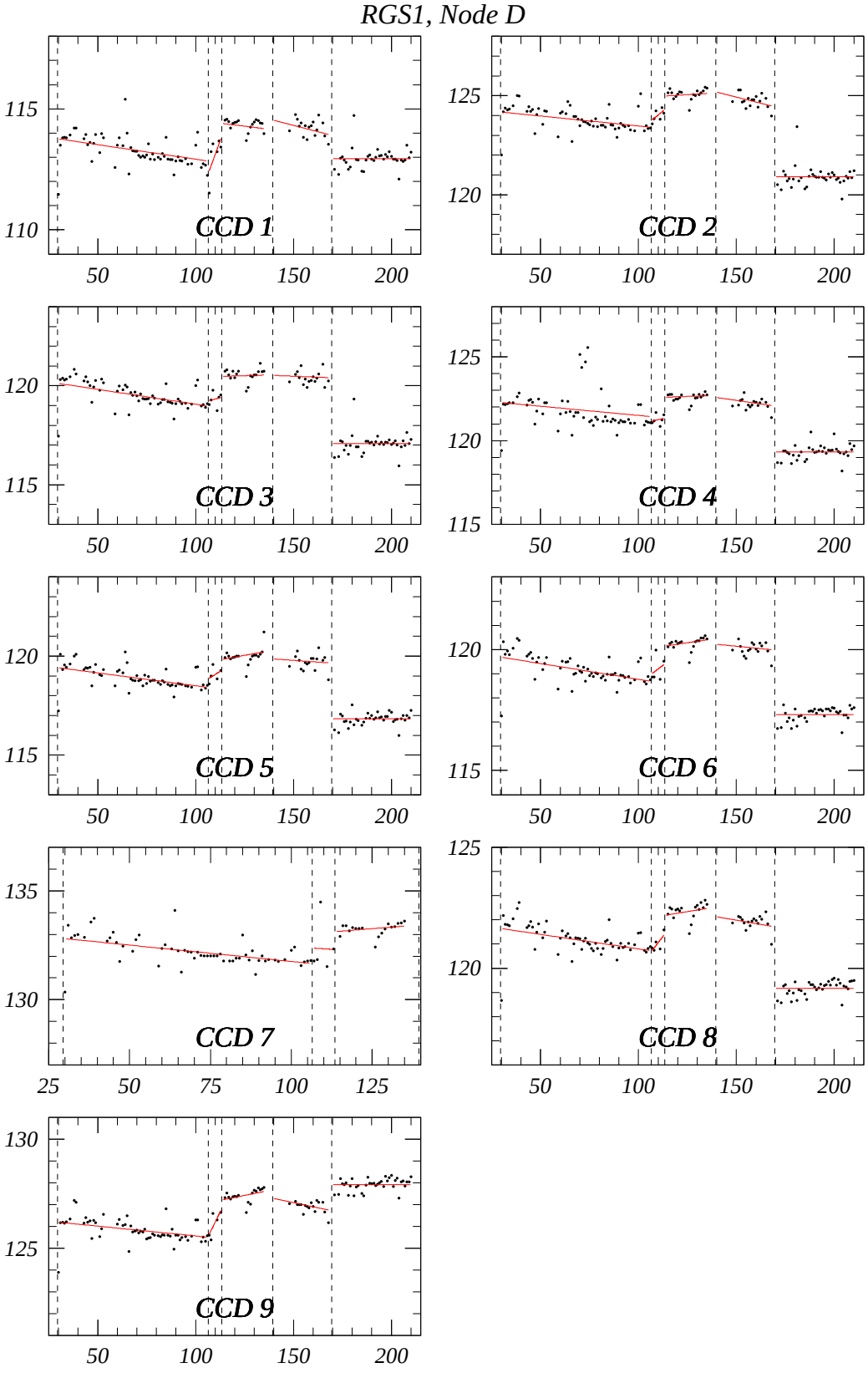

Figure 2: Offset values versus revolution number for RGS1, all CCD's nodes D.

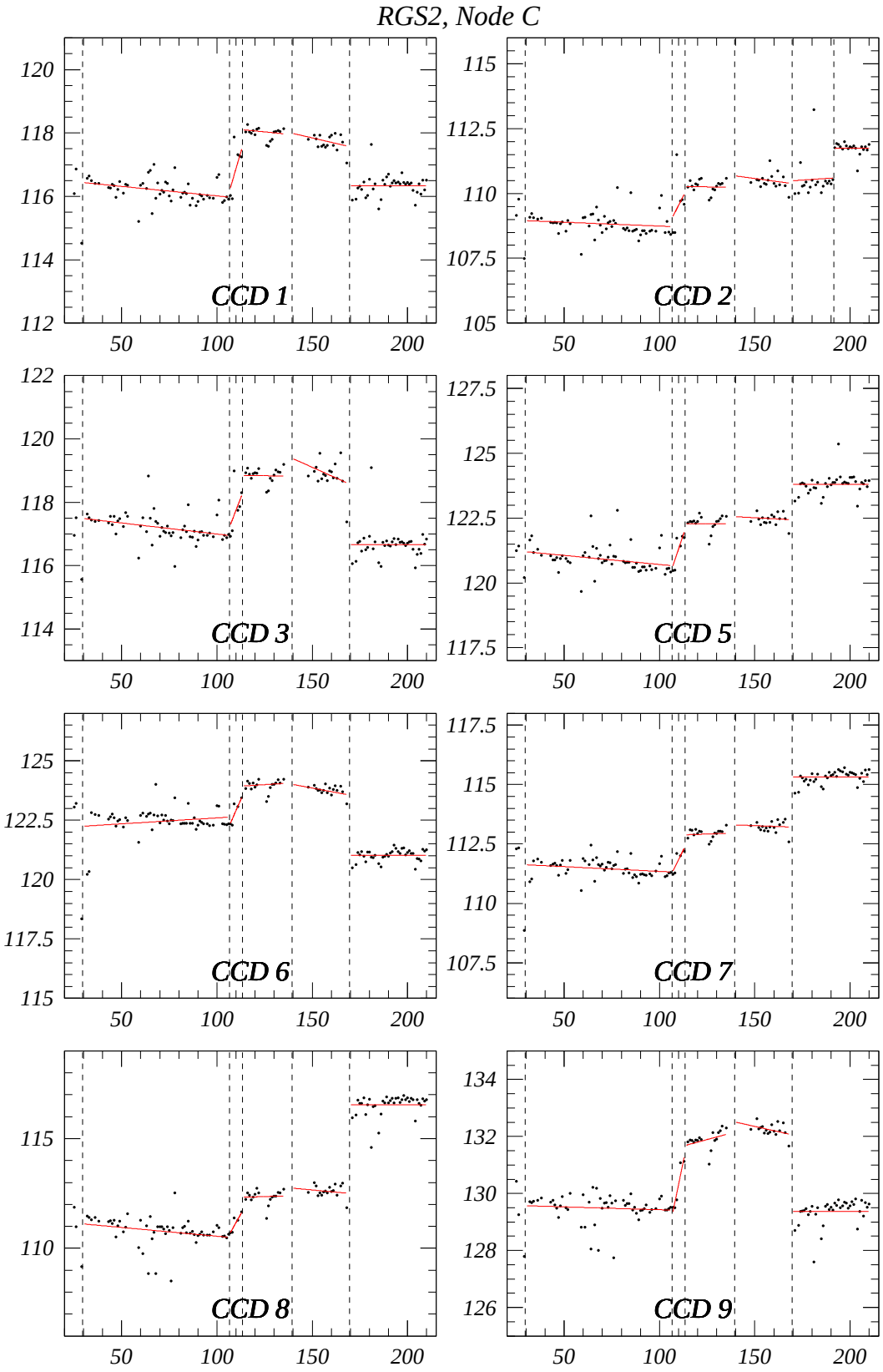

Figure 3: Offset values versus revolution number for RGS2, all CCD's nodes C.

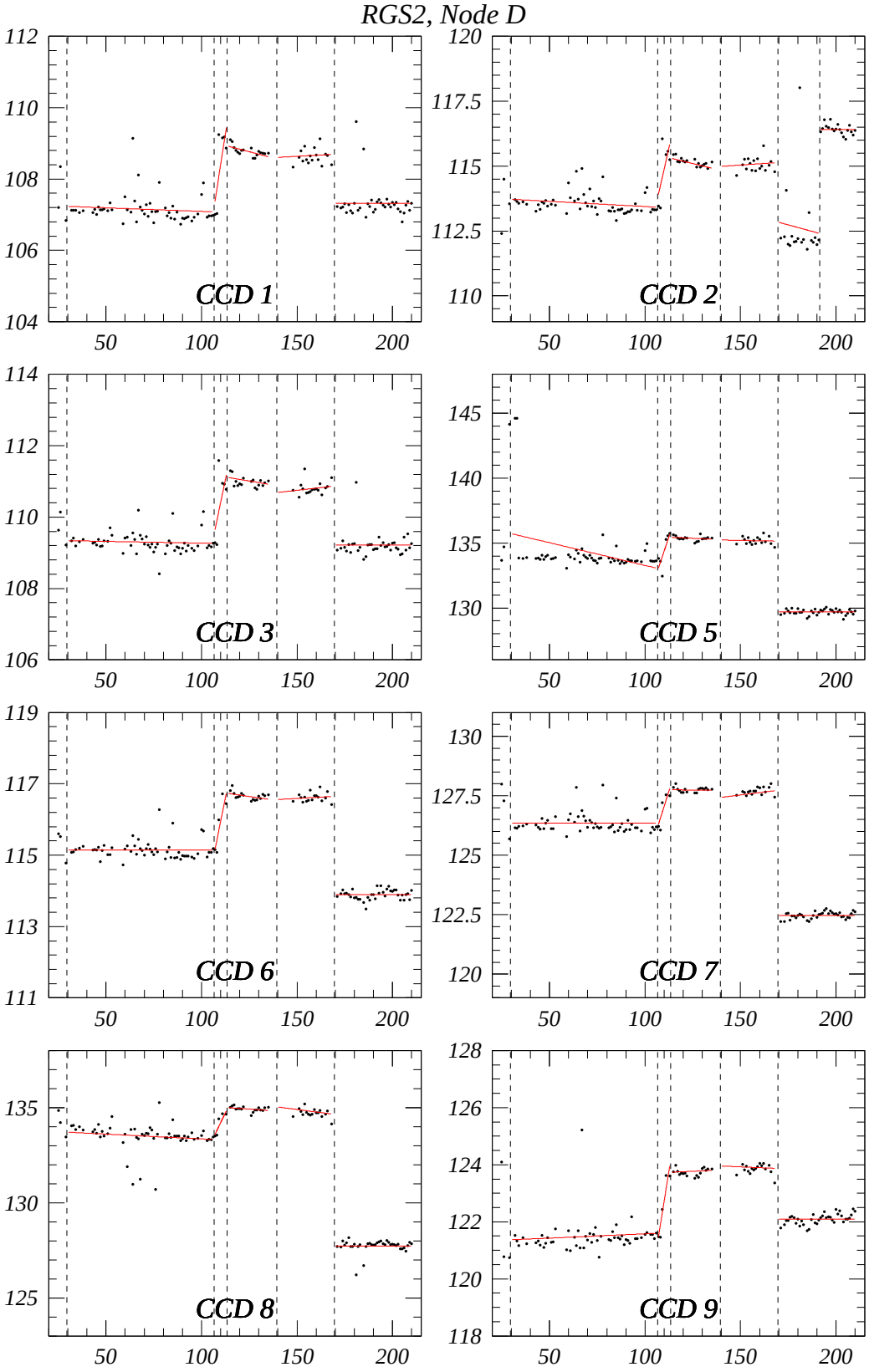

Figure 4: Offset values versus revolution number for RGS2, all CCD's nodes D.