

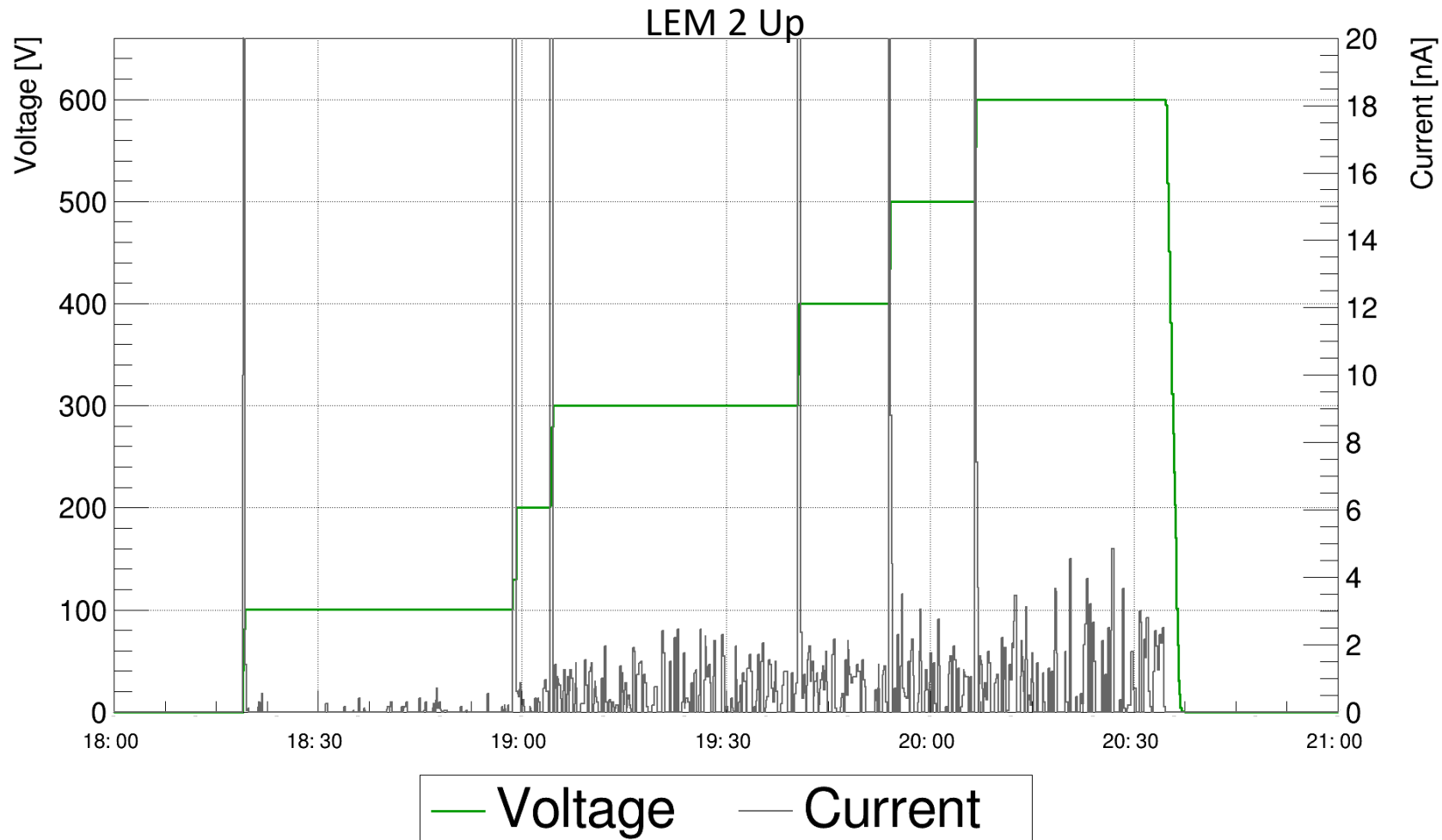
Summary of Leakage Currents

Kevin Fusshoeller, Laura Molina Bueno

Introduction

Last Weekend, we observed unusual fluctuations of the current on the LEMs. This is seen on almost all LEMs up and down.

To understand them we: -) studied them with voltages on and off
-) studied them with inverted field lines



Summary of Results

Period 1: 29/09/2017 19:00 - 20:20 (voltages on)

Period 2: 29/09/2017 22:00 - 10:00 (voltages off)

	RMS of LEM Up	RMS of LEM Down
LEM 1	0.2 nA	10 pA
LEM 2	1.2 nA	0.7 nA
LEM 3	0.5 nA	0.1 nA
LEM 4	0.8 nA	0.2 nA
LEM 5	1.6 nA	0.6 nA
LEM 6	1.8 nA	0.6 nA
LEM 7	1.6 nA	0.4 nA
LEM 8	0.6 nA	0.1 nA
LEM 9	0.7 nA	0.2 nA
LEM 10	0.4 nA	39 pA
LEM 11	0.8 nA	0.2 nA
LEM 12	(24 pA)	/

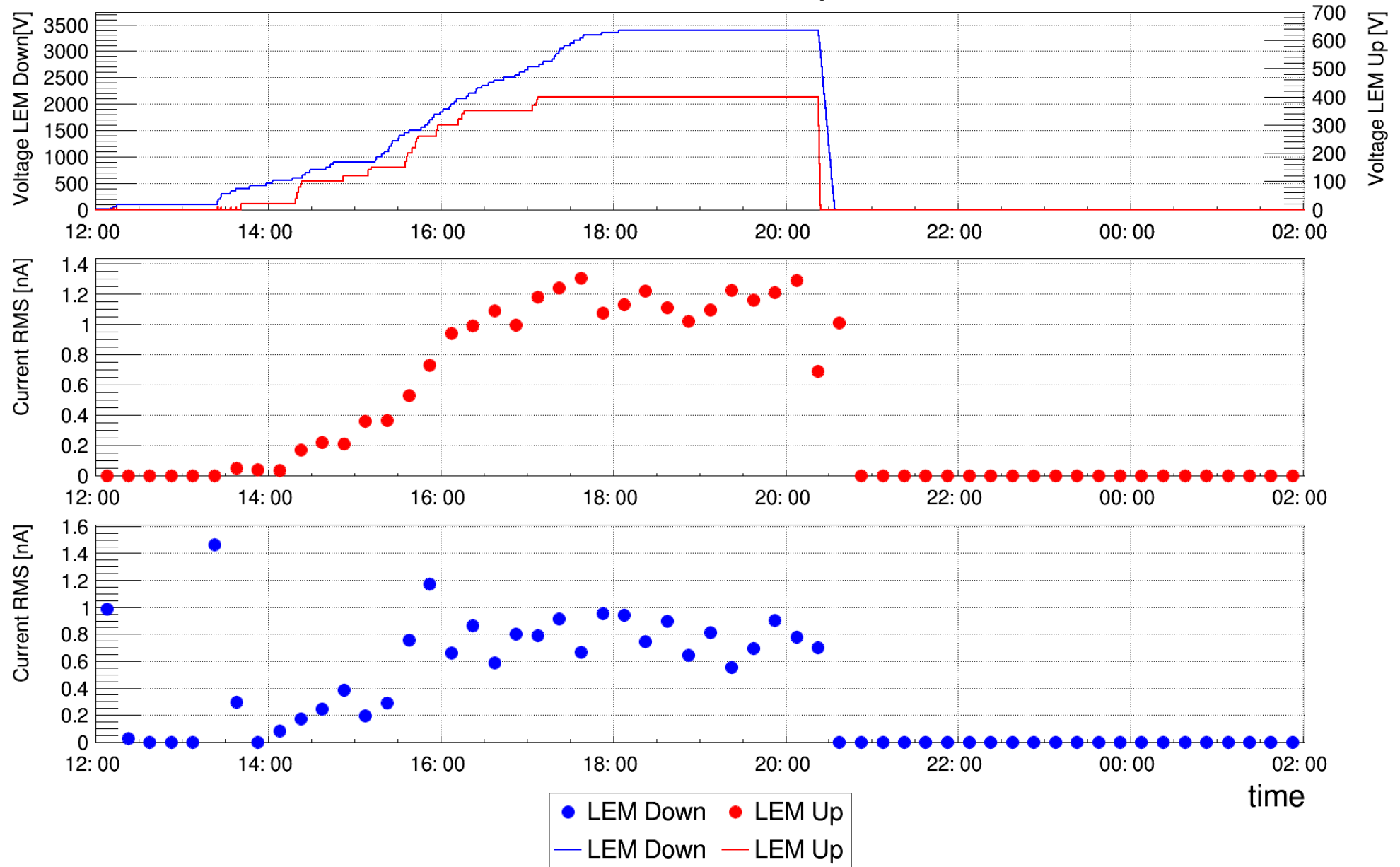
	RMS of LEM Up	RMS of LEM Down
LEM 1	/	/
LEM 2	/	/
LEM 3	/	46 pA
LEM 4	/	73 pA
LEM 5	/	/
LEM 6	/	45 pA
LEM 7	/	/
LEM 8	52 pA	/
LEM 9	/	/
LEM 10	/	/
LEM 11	23 pA	/
LEM 12	/	21 pA

Summary of Results

Period 3: 30/09/2017 18:30 - 20:30 (voltages only on LEM up)

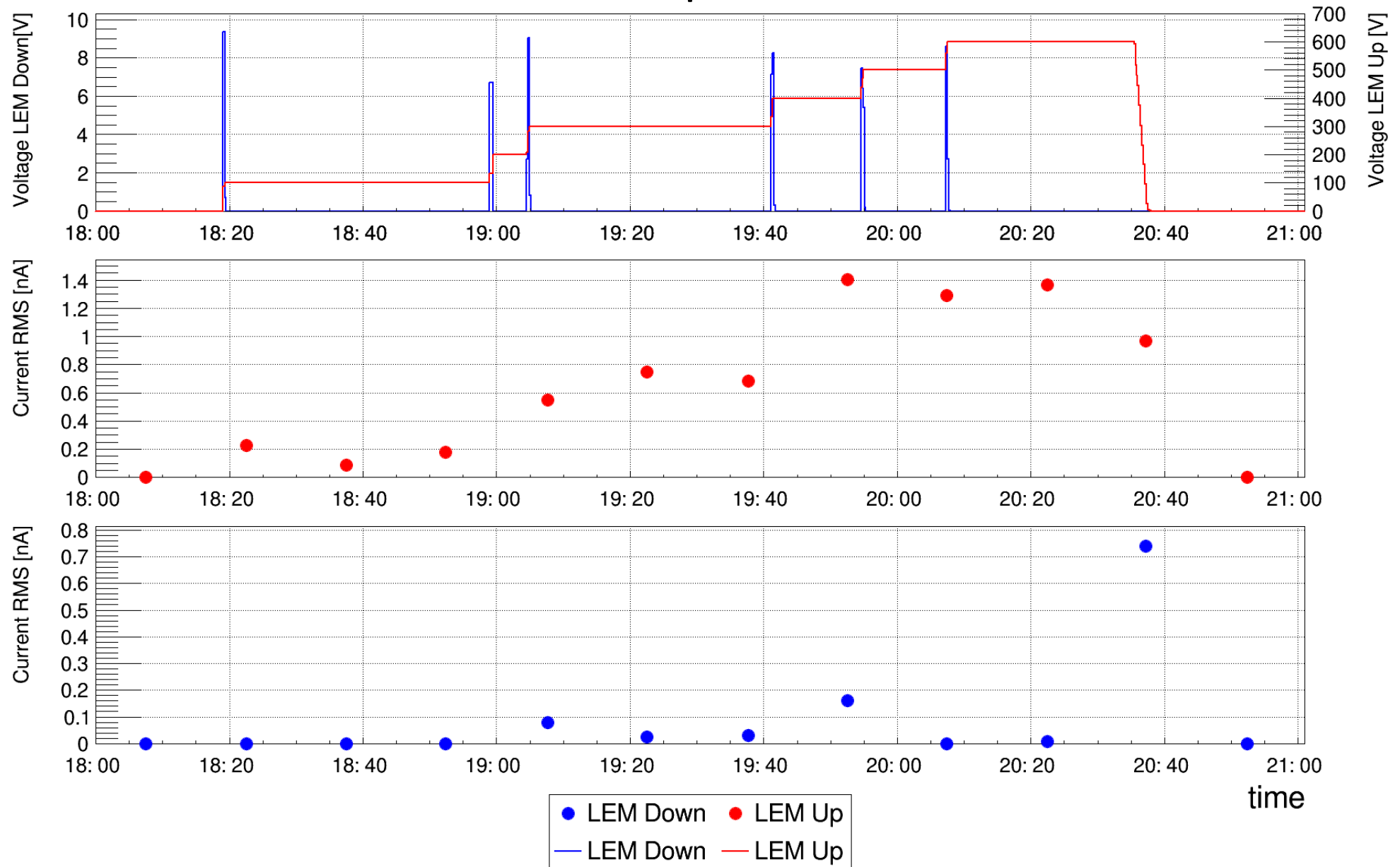
	RMS of LEM Up	RMS of LEM Down
LEM 1	/	/
LEM 2	1.4 nA	/
LEM 3	0.2 nA	/
LEM 4	1.1 nA	/
LEM 5	2.2 nA	/
LEM 6	/	/
LEM 7	1.6 nA	/
LEM 8	0.7 nA	/
LEM 9	0.5 nA	/
LEM 10	0.3 nA	/
LEM 11	0.7 nA	/
LEM 12	(24 pA)	/

Period 1 and 2: Example LEM 2



→ RMS of current scales with the applied voltage

Period 3: Example LEM 2



→ RMS of current does not depend on direction of the field lines.

Summary

- Oscillations of up to ~ 2.0 nA are observed on all LEMs except on LEM 1 down, LEM 10 down, LEM 12 up and down.
- The effect is stronger on the LEM up than on the LEM down.
- Oscillations are correlated with the applied voltage on the LEMs and disappear completely when no voltage is applied.
- The effect does not depend on the direction of the field lines.
- Problem disappeared by restarting the CAEN software again and connecting again the resistors at the of the HV cable connecting the LEMs to the CAEN power supplies.