Reminder – Measurements done on Sept. 2019
PTM CM current between Power & Driver Board

- Discharge current circulates through the coaxial cables between power board and driver board;
- The sum subtraction of the currents gives a non-zero result (150V cables probably ...);
EC LAB Blue cable noise

Bench configuration:

• Only one PTM in the crate;
• Dummy PTC ‘PRINA’ channel with a NC core for the CM filtering (Hi Imp at the scope);
• TT loaded with diodes and snubber capacitors;
• Last secondary diode cathode connected to the PTU crate through a long ‘return’ wire (eq. gen chassis);

PTM with Driver V4 generates more noises to the of driver
+ 7V p-p
o 9V p-p
X 7.4V p-p
PTMs equipped with driver V4 brought more noise to the IPOC measurements of the Retriggering pickups (for example CTs2A)
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Less critical at high energies (7.5 TeV)
PTM with V4 Driver
CM current in LEMO cable connecting (TRIG COMP) Driver Board with Power Board

Current amplitude effectively reduced with respect to the previous (September) measurements.

Further attenuation of the noise with the NC core at the R&B HV pair inside of the PTM 85.9[A p-p] -> 37 [A p-p]
2.1m piece of cable shielding quality measurement with new part for metallic sheath fastening (*TE-ABT-EDS*)

Through measurement with the RLC meter we measured stable inductance of the shielding at 100kHz 1.6uH, resistance 58mΩ (influence of connections)

Resistance estimated through DC current measurement (2A) 15mOhm

The design is being improved a little bit in order to clamp the cable and to avoid the rotation of connector w.r.t. the cable
A burst of six consecutive triggering/re-triggering pulses was applied every 1s for around 24h leading to the resistor value increase $10k\Omega \rightarrow 80k\Omega$

Also burned points appeared at the surface of the resistor.

No information is spec about the pulse capabilities of the resistor (J).

From the voltage across the resistor we measure less than 0.1J generated per resistor per cycle.
Conclusions

• Amplitude of the CM currents circulating between the driver and power board inside of the PTM is significantly reduced with Driver V4; If needed, further reduction of this CM current can be achieved with a NC core at the Red&Black HV pair inside of the PTM;

• Some signals (ex blue cable and I OUT) are more ‘noisy’ with Driver V4; It is recommended to check other critical signals of the crate/generator due to this modification (V4);

• Charging resistor fault was reproduced at the test bench; Power stress applied to the resistor was within the specification; Lack of specification for pulsed capabilities of the resistor;

• New part for metallic sheath clamping of the red cable makes good electrical connection, some additional improvements are being studied in order to avoid the damage due to bad manipulation;