

Title: Radiation and magnetic field qualification of LVPS – a common 12V DC power source for the CMS detector.

Supplementary materials

List of abbreviations

BTL	Barrel Timing Layer
CMS	Compact Muon Solenoid
EB	Electromagnetic calorimeter Barrel
EC	Endcap Calorimeter
ETL	Endcap Timing Layer
HL-LHC	High-Luminosity Large Hadron Collider
LHC	Large Hadron Collider

References

[1] T.Gadek et al., *DC-DC converters for the CMS MTD BTL and ECAL for HL-LHC.*, JINST 18 C02038, 2023

[2] K. Stachon et al., *Universal test system for boards hosting bPOL12V 6 DC-DC converters.*, JINST 19 C04032, 2024

Figures

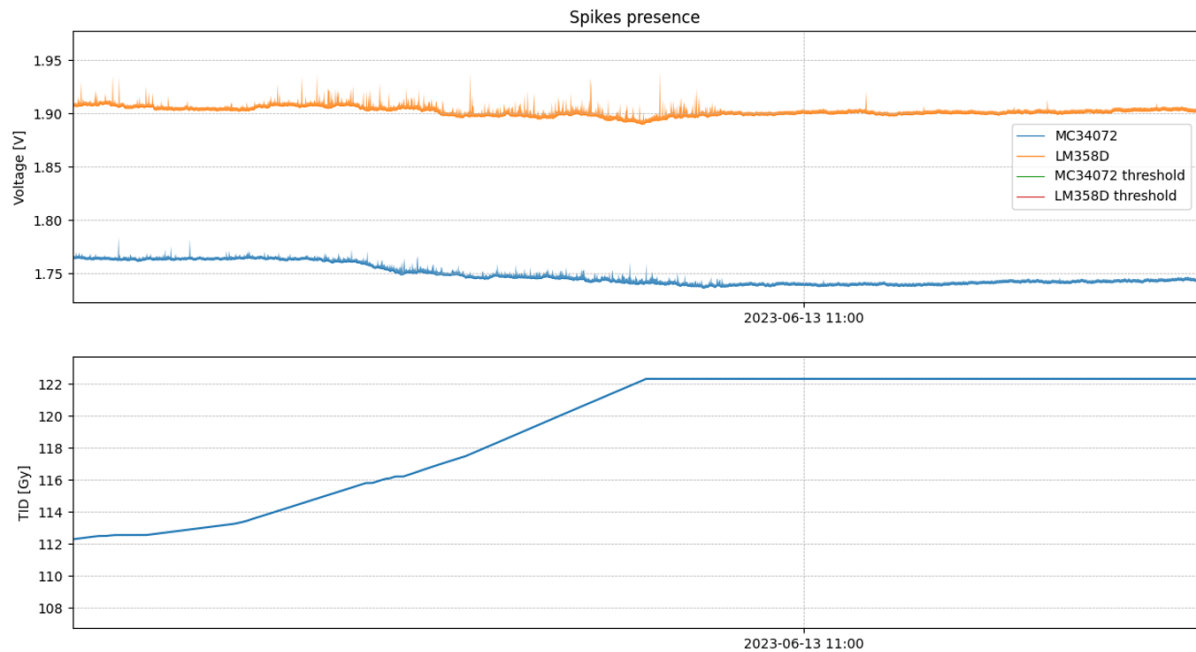


Figure 1: Presence of radiation-induced spikes measured at the output of a signal amplifier. There is a correlation between presence of spikes (top plot) and presence of irradiation (bottom plot).

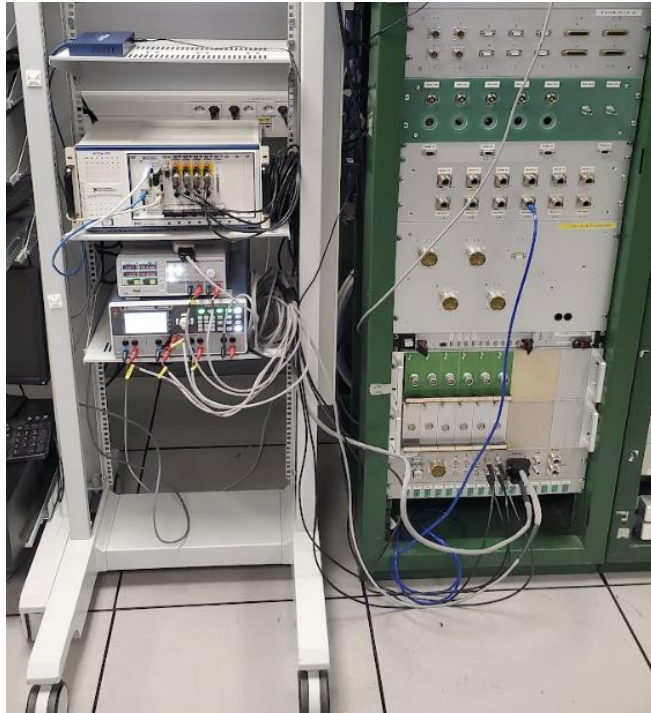


Figure 2: Rack with measurement devices used for continuous simultaneous data acquisition. The main device used was NI PXIe system with DMM4081 modules.

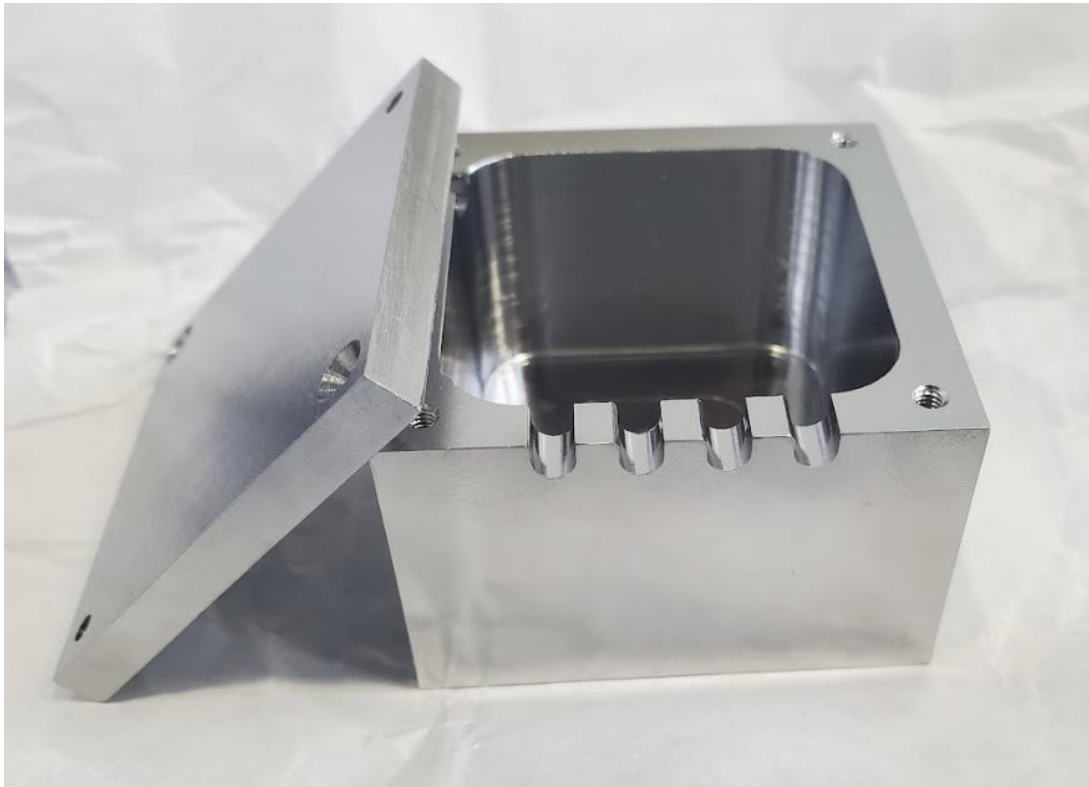


Figure 3: A photo of the magnetic field shielding box made of ARMCO – a high purity stainless steel.

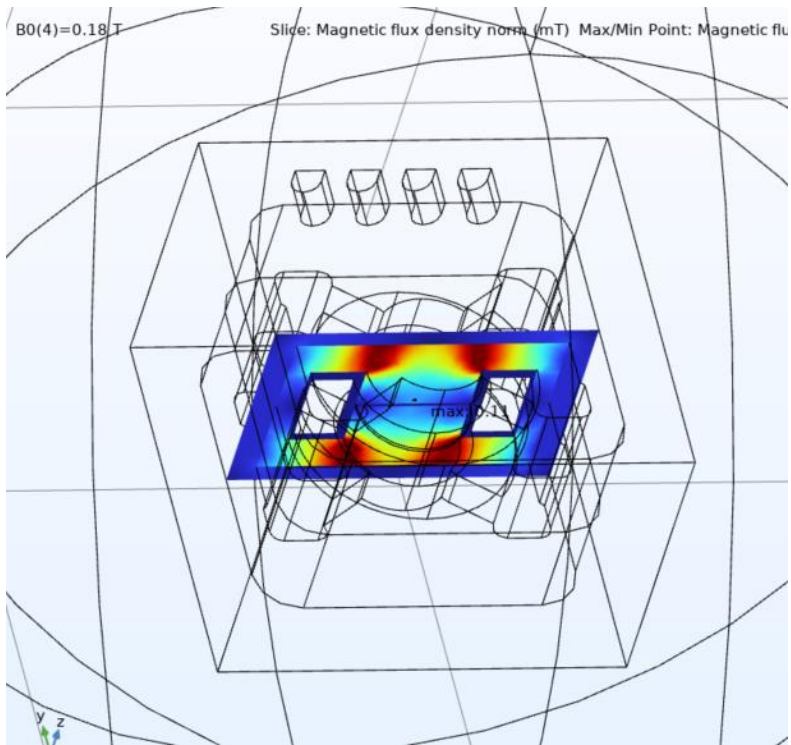


Figure 4a: 3D model of the shield and transformer inside with highlighted surface of plotting.

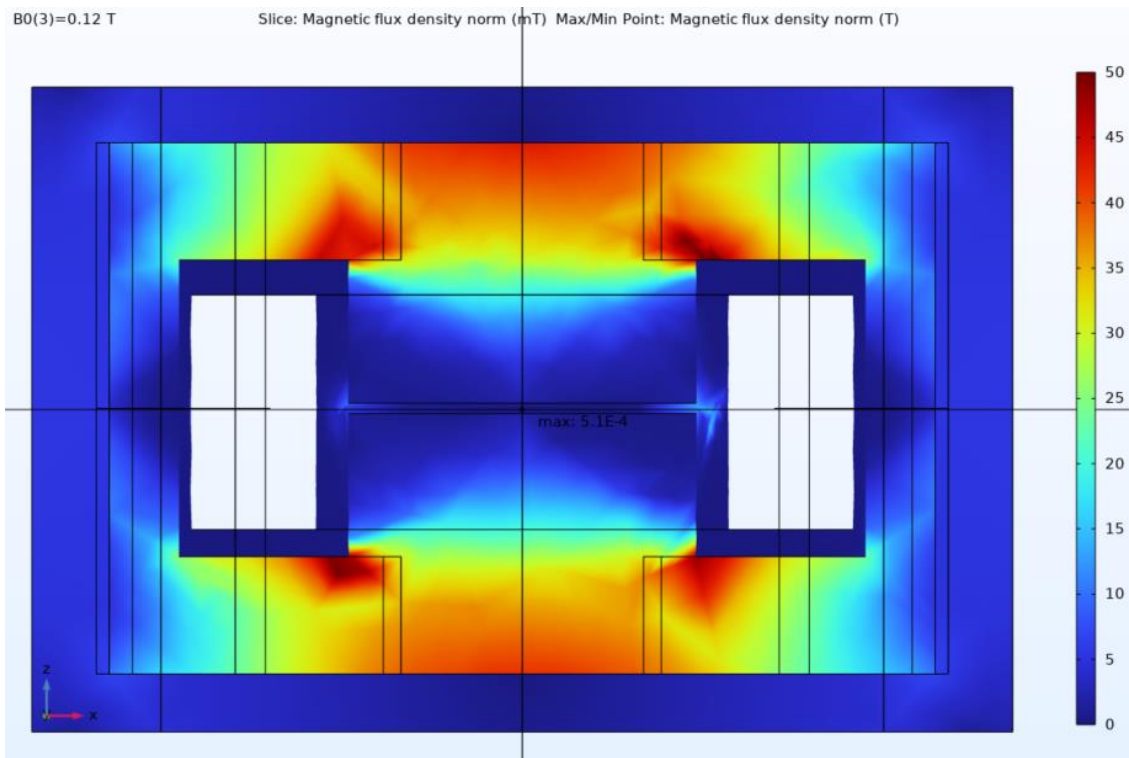


Figure 4b: Magnetic flux density penetrating core of the transformer when ARMCO shield is not annealed after processing.

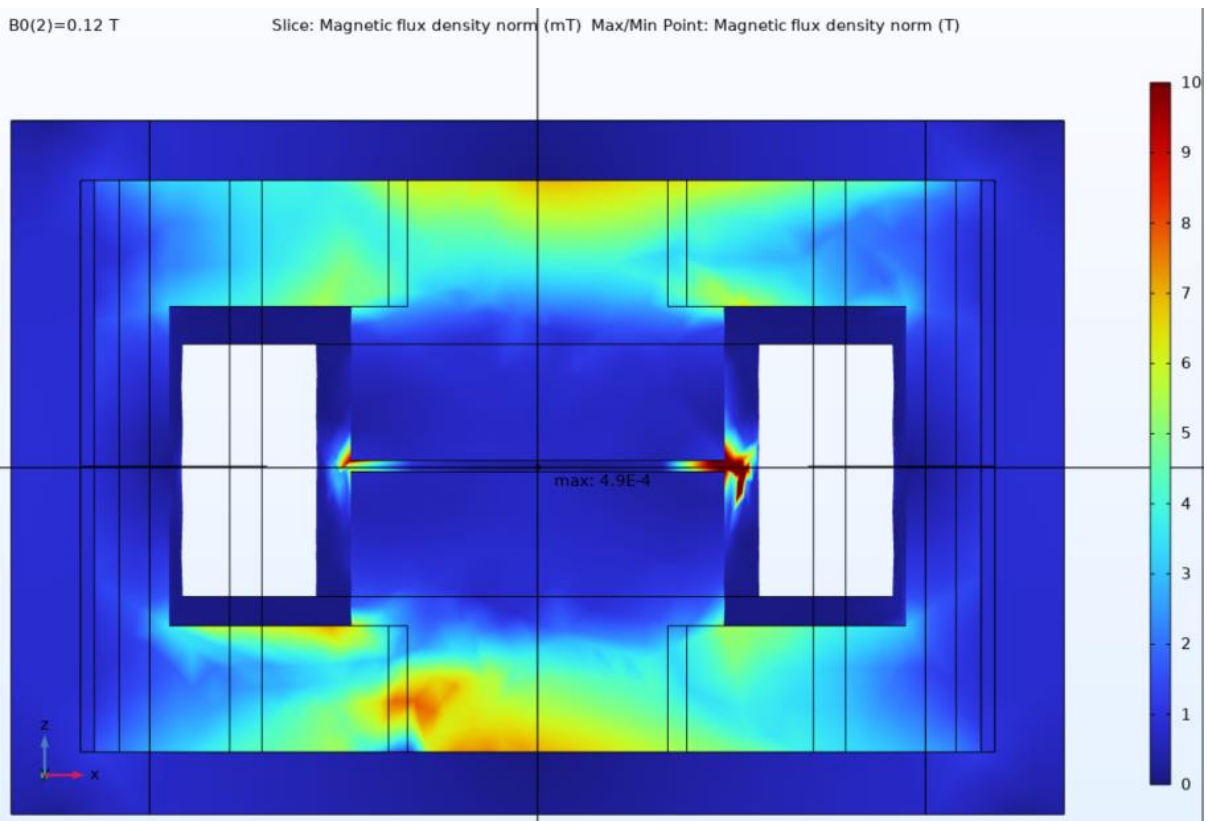


Figure 4c: Magnetic flux density penetrating core of the transformer when ARMCO shield is annealed after processing.