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## Project HiVoSS – High Voltage Solid Switch

### Context

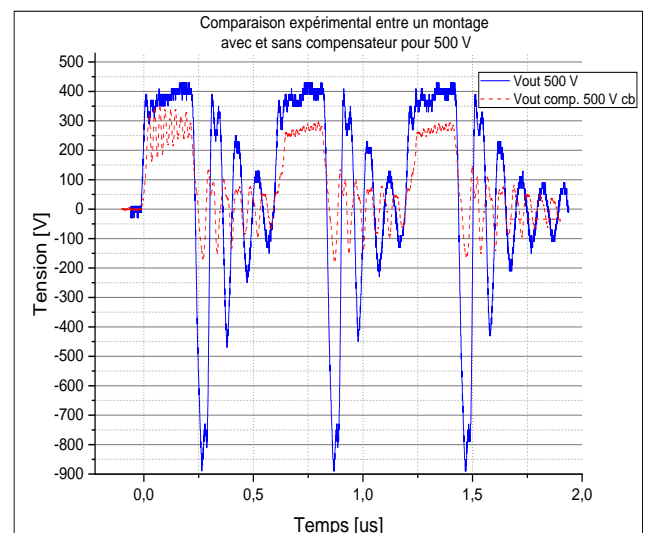
The flash X-ray evolves year after year, this scientific process is used to perform imaging, at atomic scale, in a very short time and in a moving body. For example, an explosion. The current technologies allow to realize an image of good quality but the present wish is to realize a catch of several images in a row. For this it is necessary to produce as many square signals, high voltage and current (250 kV, 20 kA) identical and without parasitic oscillation in a small-time interval, as desired image.

To date, the signals generated are degraded due to reflections caused by the first square pulse, which results in poor quality images and makes them unusable.

Our goal is therefore to compensate, to remove these defects in the most intelligent way possible, to obtain, at the end, a series of good quality images.

### Discussion and first Result

To overcome these defects, we want to add a power electronics module between the load and the transmission line. We want to both adapt the impedance and clip the high and low voltage plate. As a first approach we use SICMOSFETs associated in series/parallel which are polarized via a TVS diode to clip the values of the High Voltage plate. On the right a first encouraging result, with the signal in initial conditions in blue and in red with the addition of our electronic module. The HV plates are clipped and have a ripple rate of less than 3%. For the inter-pulse oscillation, the amplitude is divided by 9.



The objective is also to develop a test bench to characterize the parasitic elements of the semi-conductors to allow us to select the best components according to the required application.