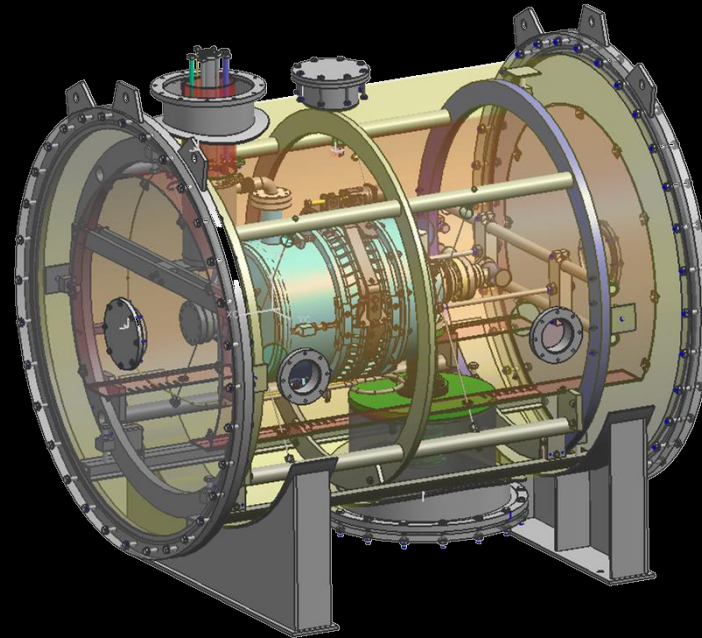




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C&C activities on Cold Tuning Systems

EuCARD-2/MAX Accelerators for ADS Workshop

I. Martín & N. Gandolfo



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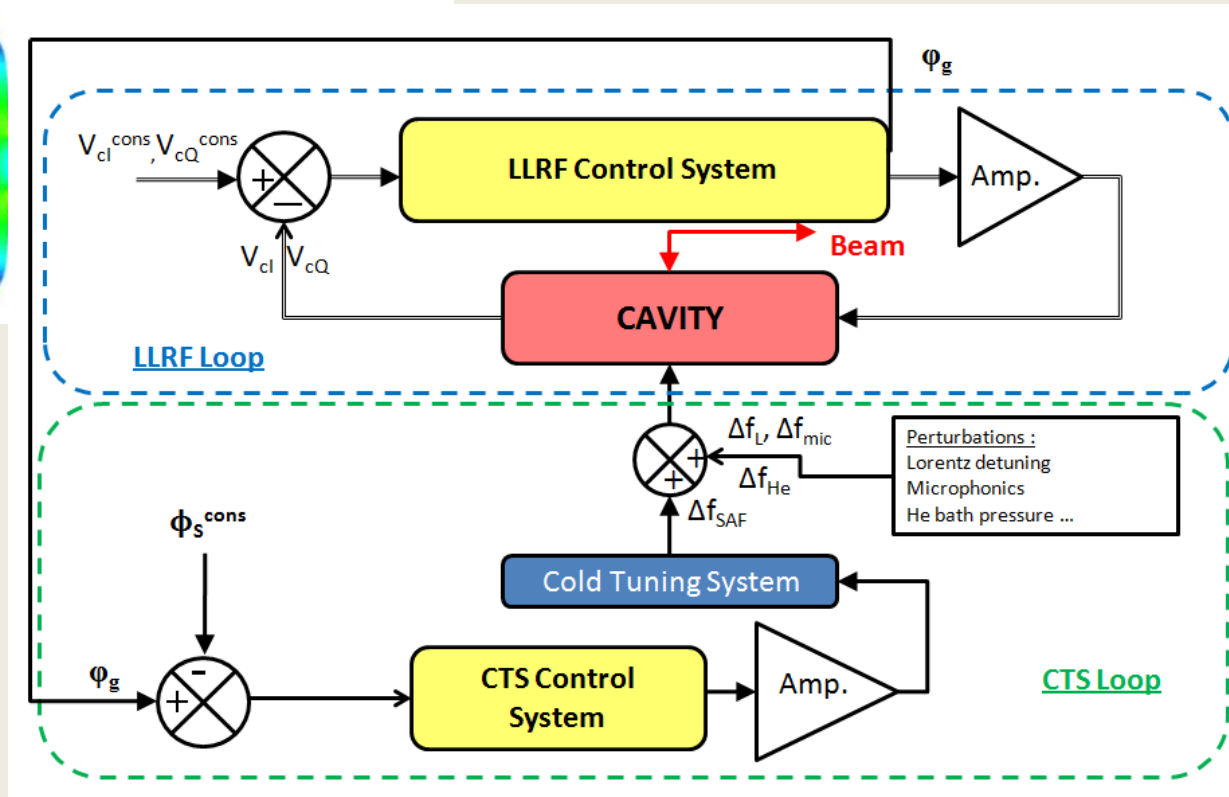
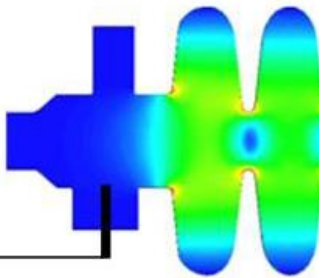


I. GENERAL CONTROL STRATEGY



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In the actual “state of the art”, **control systems are designed in a context of certainty**, where a precise model of the process to control has been previously developed. The performance of the designed control system in the model context is optimal.

However, the fragility of this conception is that, in fact, reality is not a dream, which means that **the process behavior deviates from the model** and when this happens **the control system introduces instability into the real process** and the control performance deteriorates.

Due to its adaptive nature, **ADEX technology allows for the design of the control system in a context of uncertainty**, that is to say, no knowledge of the process dynamic is required, thus no need for a previous model nor for the knowledge of the changes in the process dynamics. And in this context, **the ADEX controller adjusts in real time to the process dynamics** and their variations with time, **guaranteeing process stability and sustained optimal performance**.



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II. OPTIMIZED ADAPTIVE COLD TUNING SYSTEM CONTROL STRATEGY

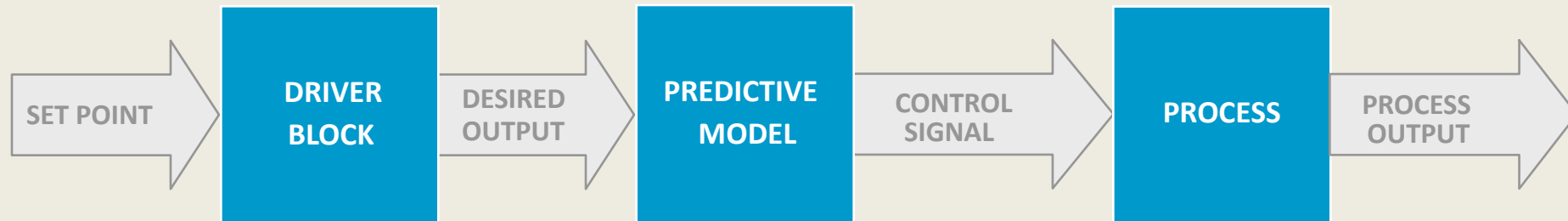


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ADAPTIVE PREDICTIVE EXPERT CONTROL IN BRIEF



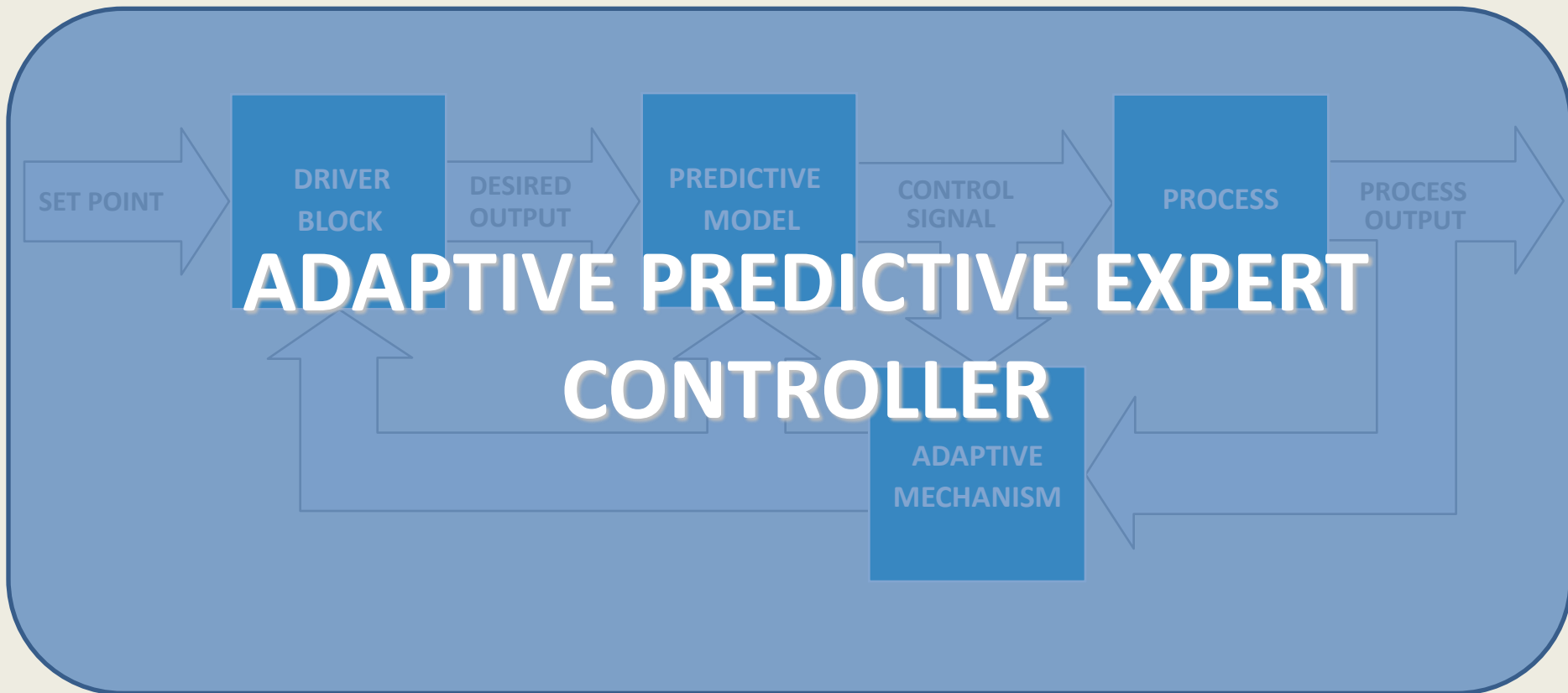


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ADAPTIVE PREDICTIVE EXPERT CONTROL IN BRIEF



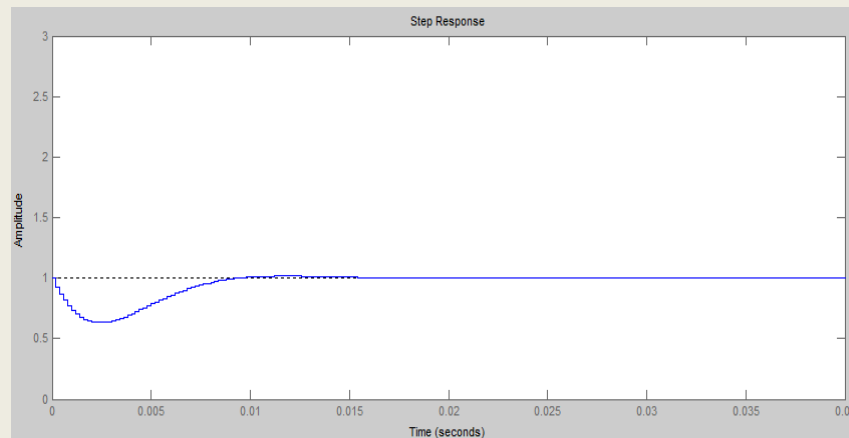
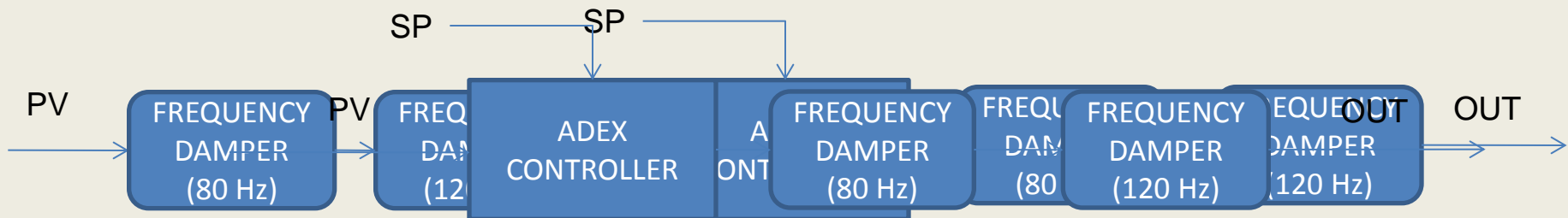


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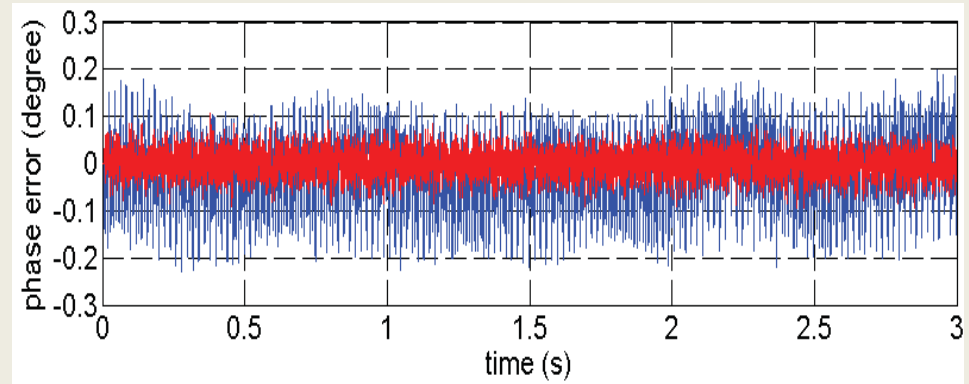
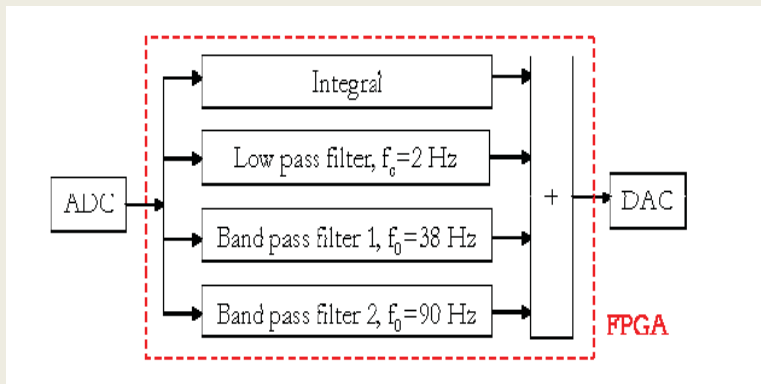
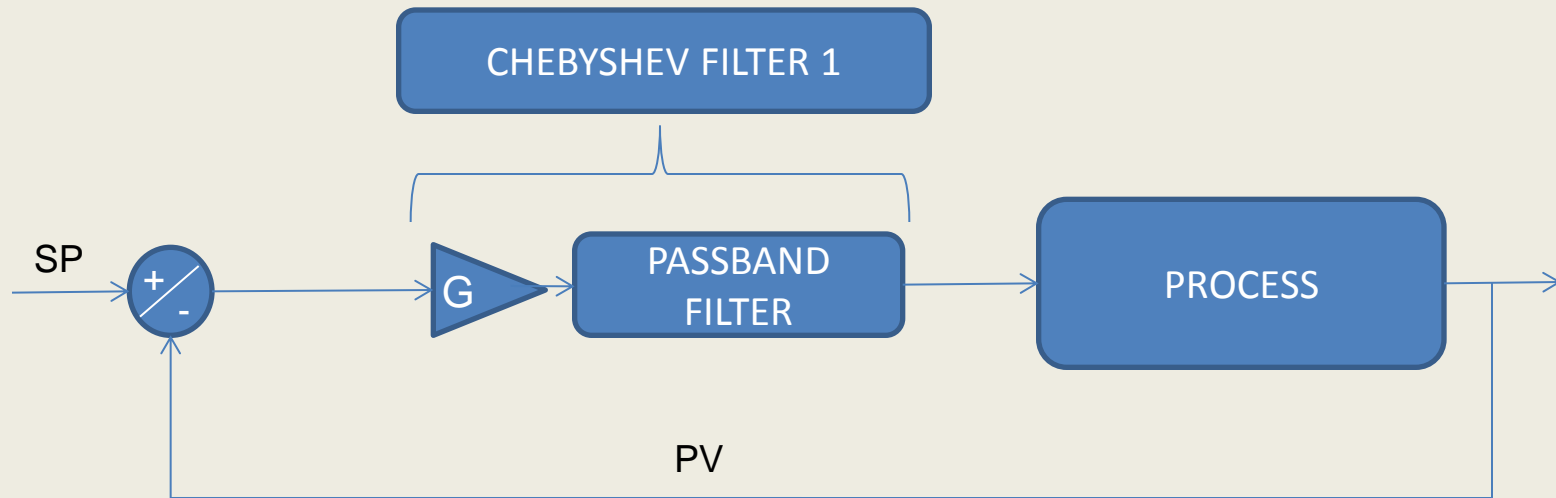


FREQUENCY DAMPERS



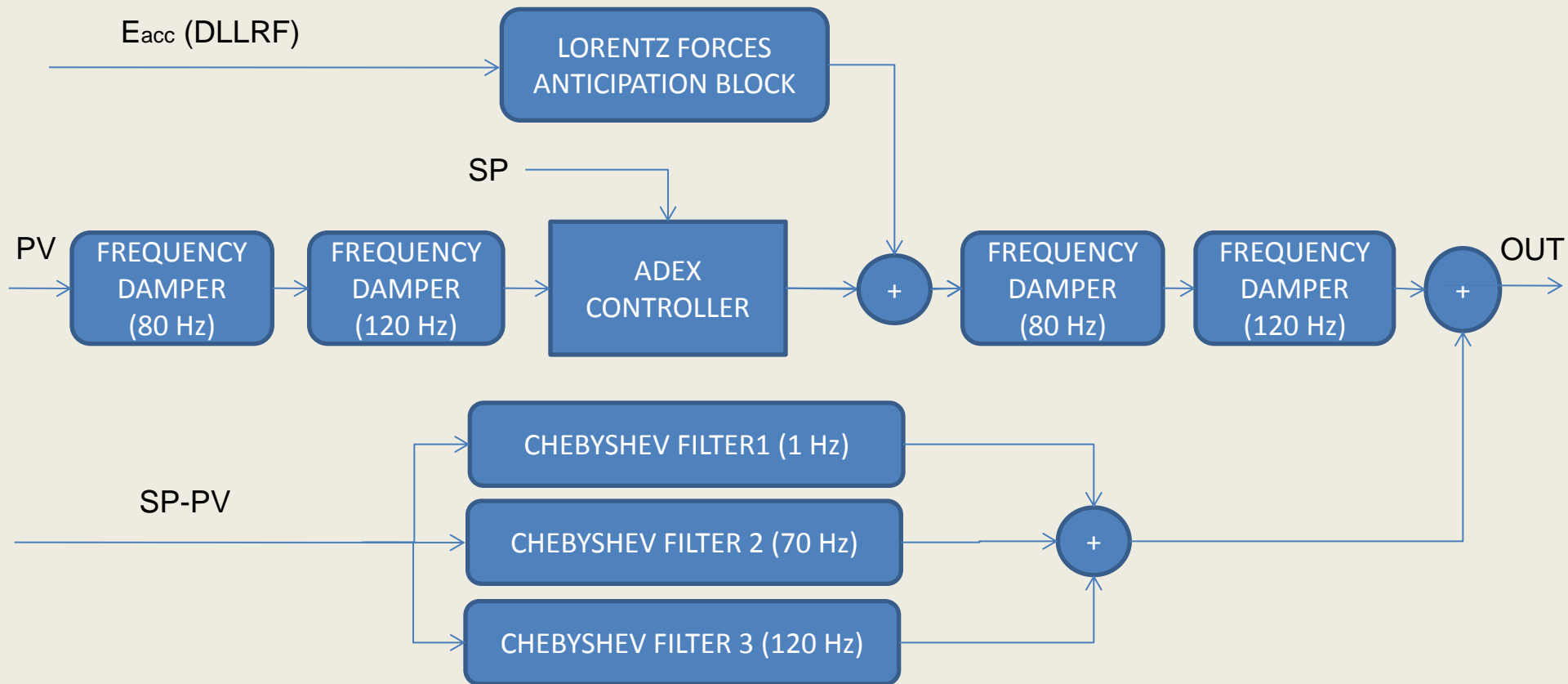


CHEBYSHEV FILTERS





OPTIMIZED ADAPTIVE CONTROL STRATEGY



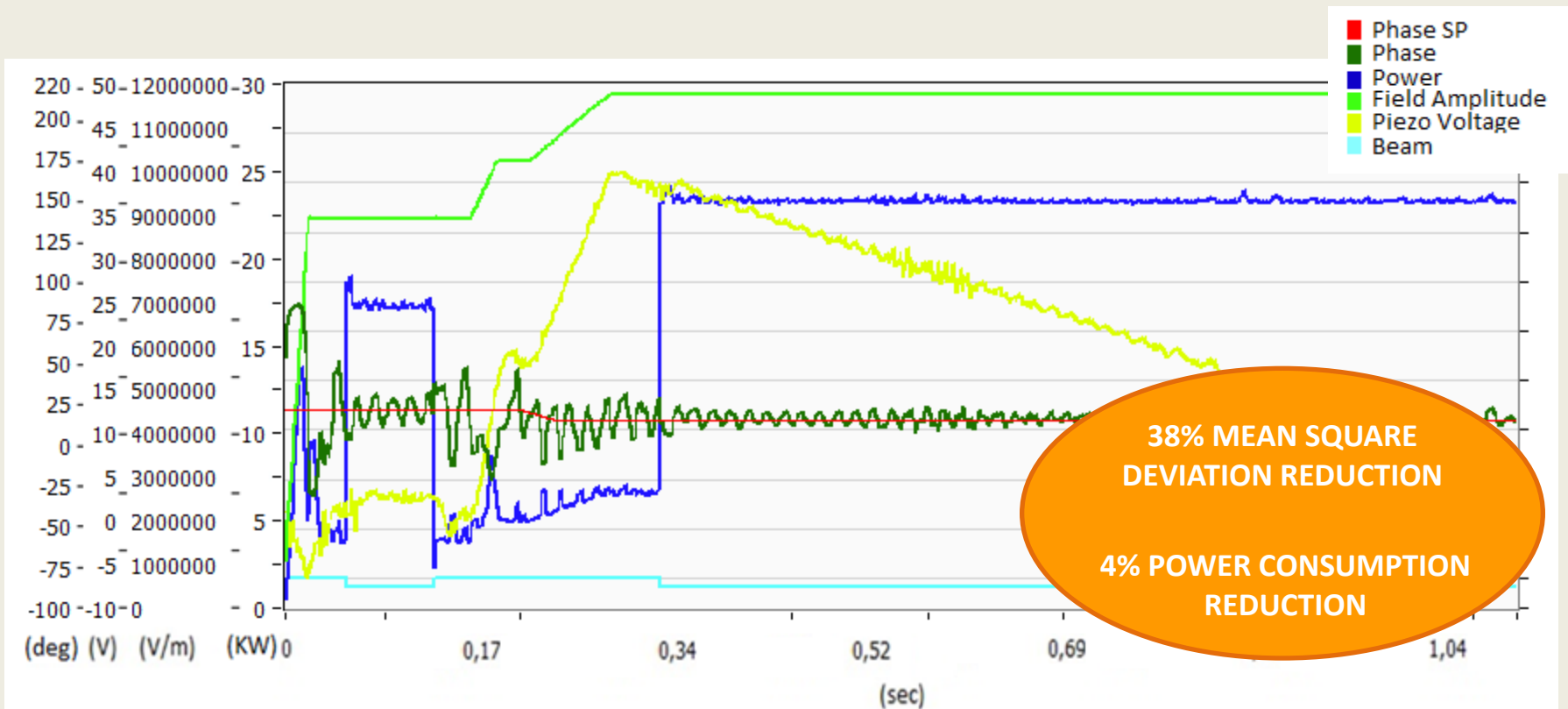


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CONTROL STRATEGY: SIMULATION RESULTS





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III. CTS CONTROL PLATFORM

HARDWARE STRUCTURE FOR THE CONTROL STRATEGY IMPLEMENTATION

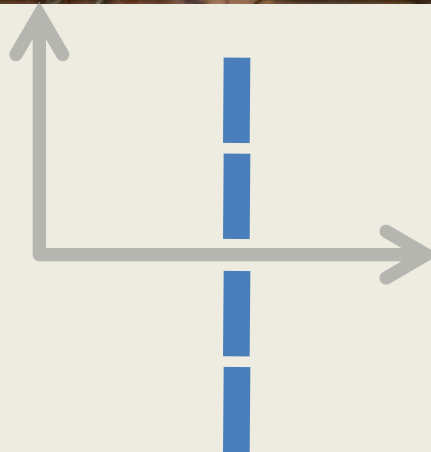
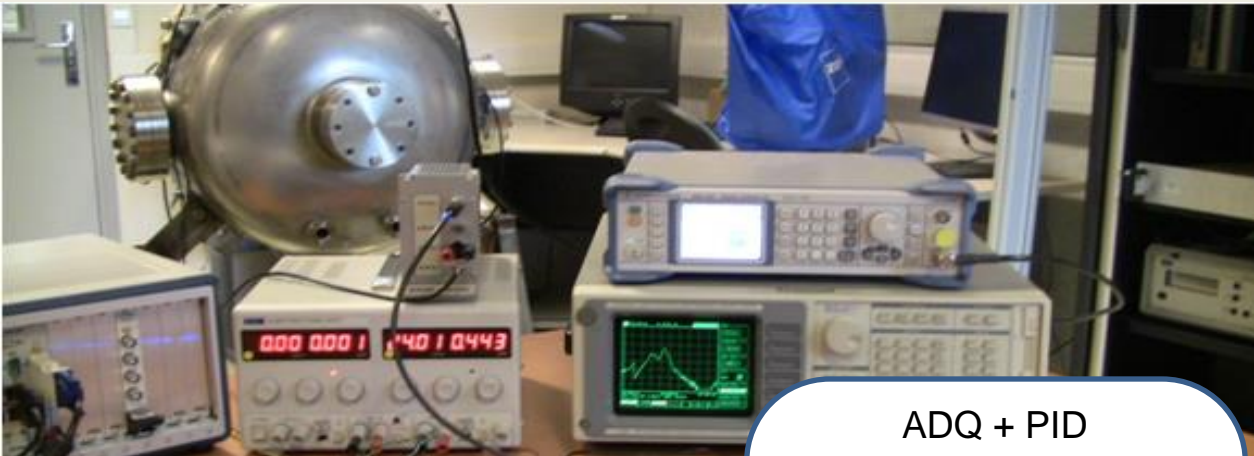


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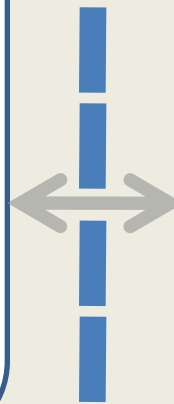


CTS PLATFORM: HARDWARE STRUCTURE



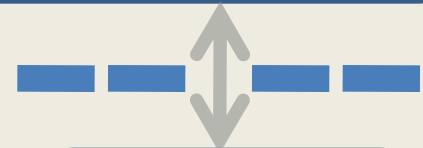
ADQ + PID

dsPIC - IPNO



Adaptive Controller

DELFINO TI - ADEX



Filtering, Lorentz ...

Cyclone III

FPGA - ADEX

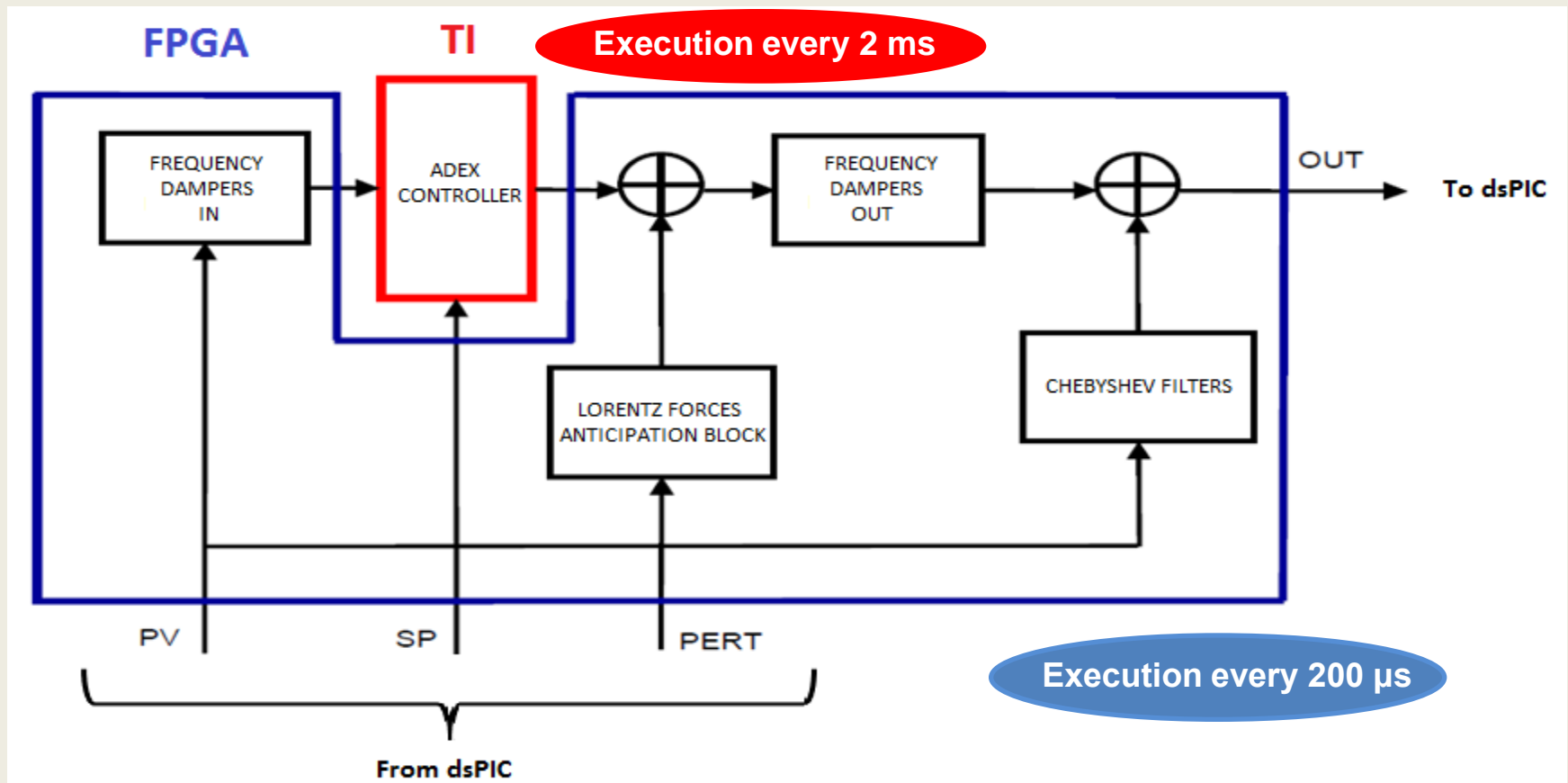


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CTS CONTROL PLATFORM: CONTROL STRATEGY IMPLEMENTATION



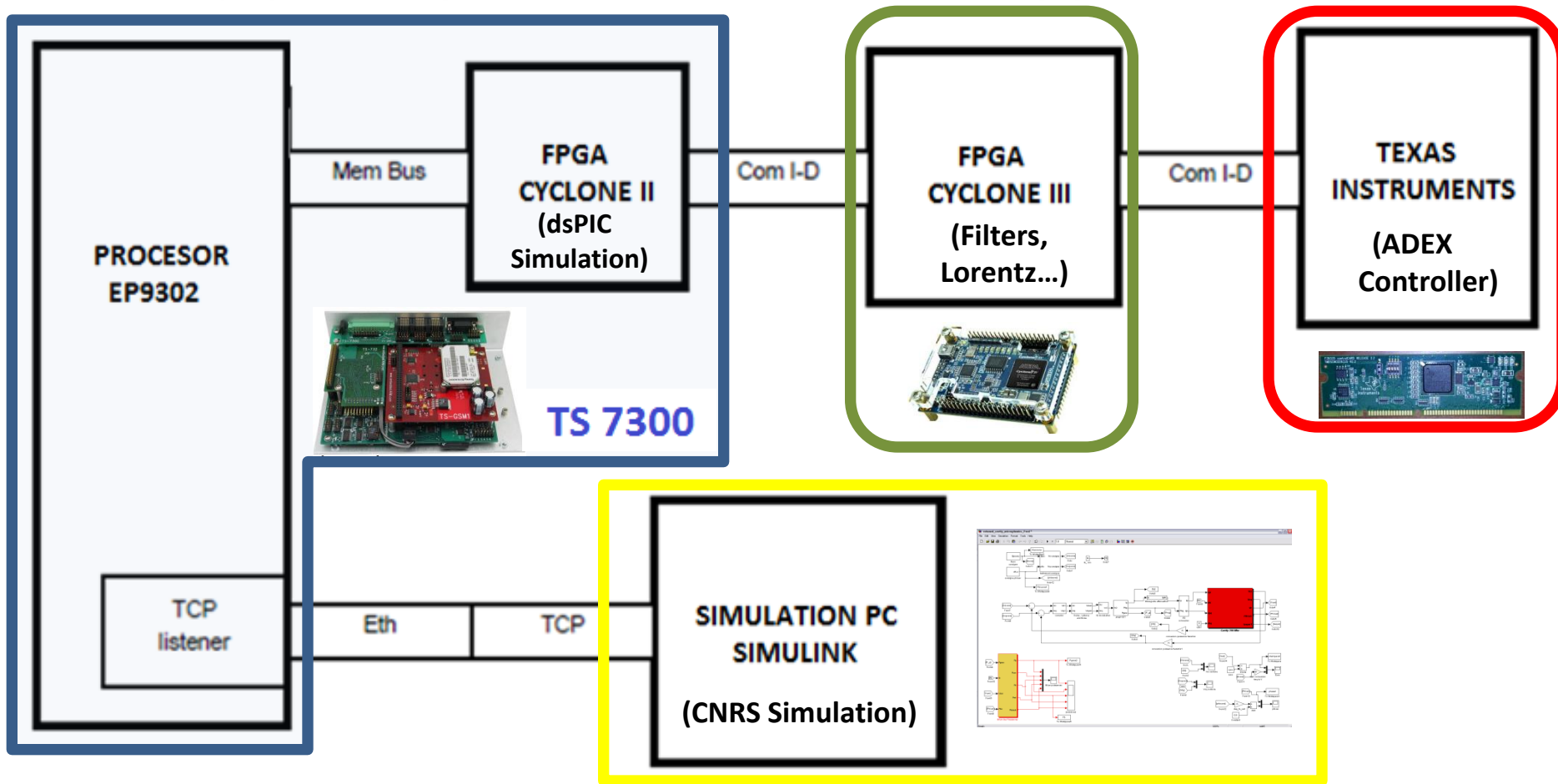


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CTS PLATFORM: HARDWARE IN THE LOOP VALIDATION



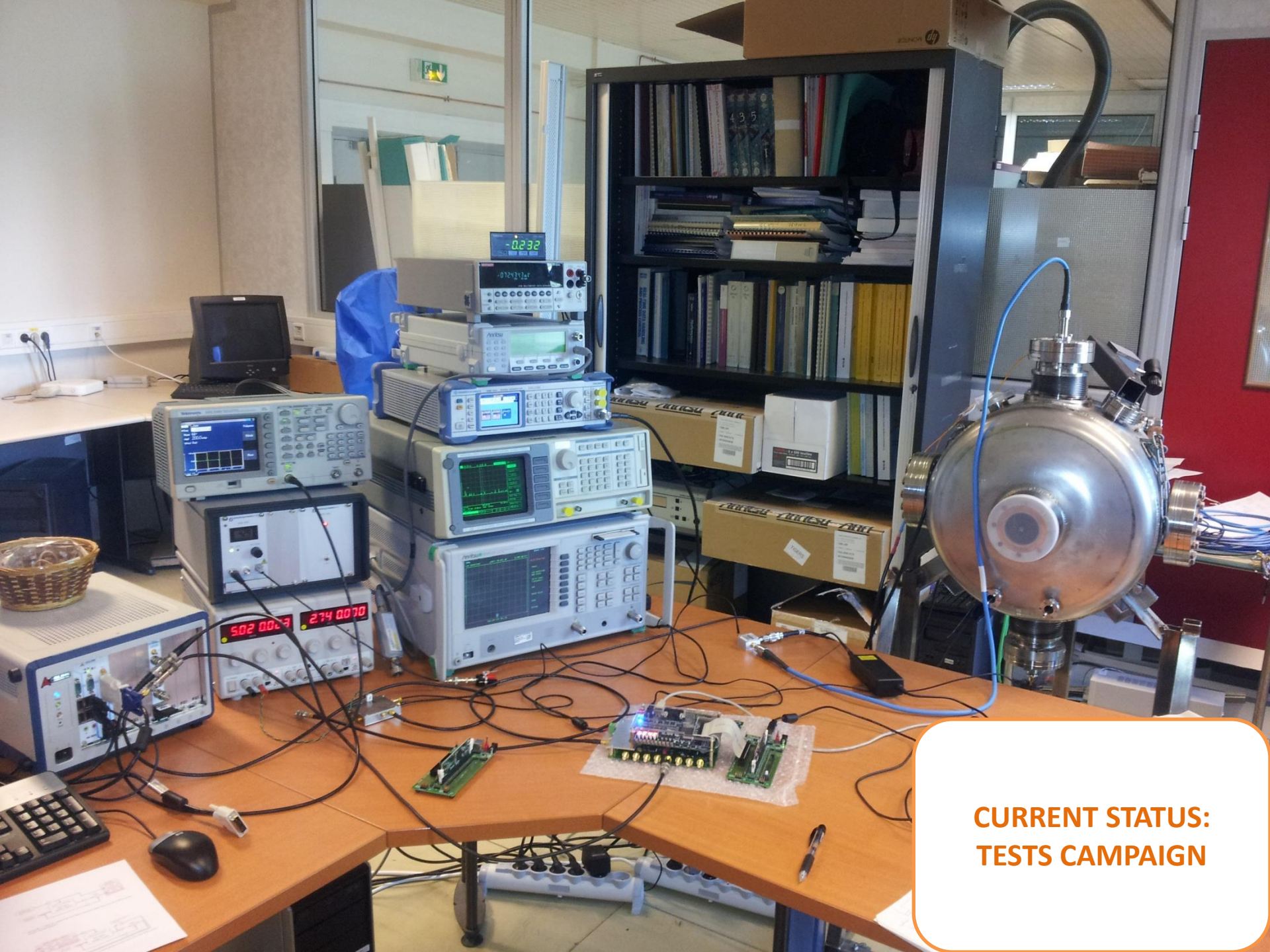


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IV. TEST CAMPAIGN



**CURRENT STATUS:
TESTS CAMPAIGN**



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THANKS