Performance of BPM Readout Electronic Based on Pilot-Tone Generator and a Modified Libera Spark at ALBA

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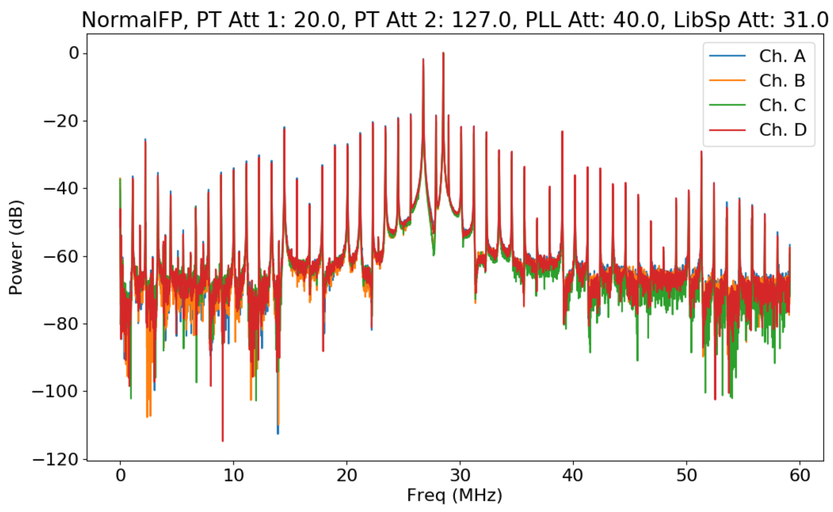
Abstract

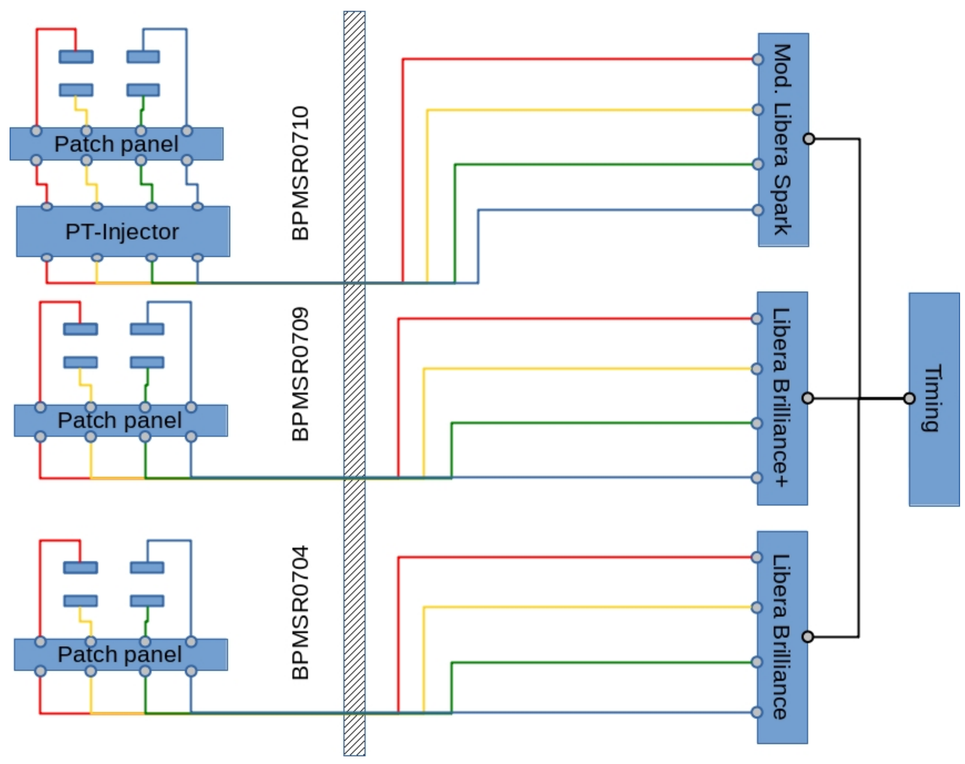
As many synchrotron radiation sources, ALBA is also going through an upgrade project. At the same time, the world of BPM electronic is evolving fast to keep up with the stringent requirement of new facilities. In order to follow the situation closely and develop know-how for the future, we decided to install and test in our storage ring a BPM readout system composed by a Pilot-Tone generator (developed by Elettra) and a modified Libera Spark (by Instrumentation Technologies). We compare position measurement results and stability with the ones obtained by our standard Libera Brilliance and a Libera Brilliance+ electronics.

Pilot-Tone

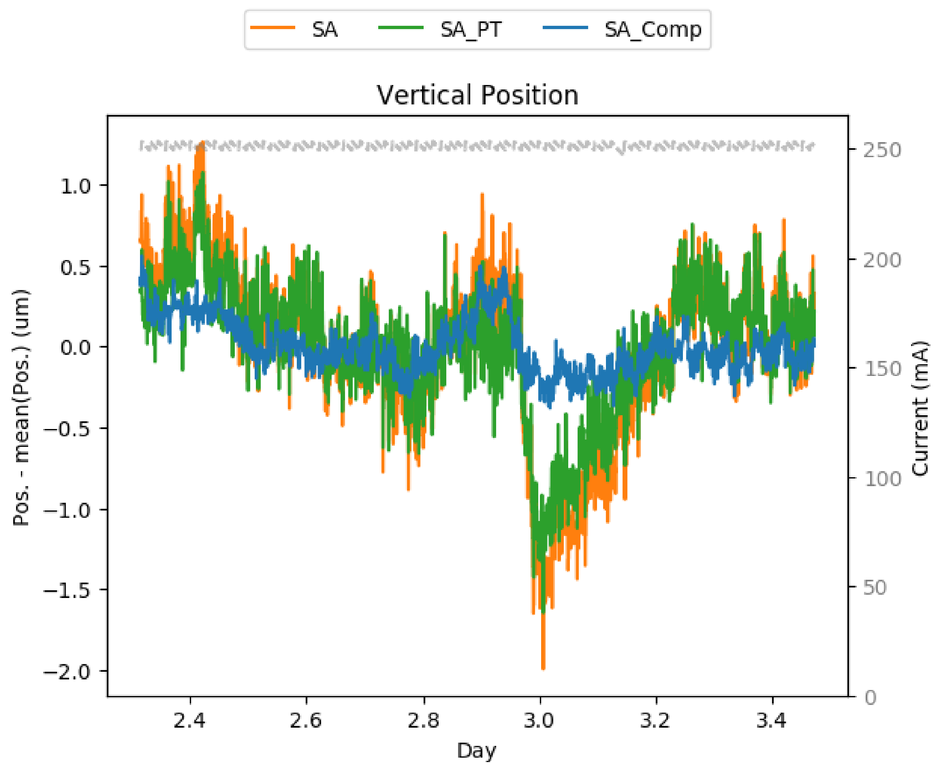
The system is composed by a PT generator and a modified Libera Spark. The PT generator produces a sinusoidal RF signal at a frequency close to the one of the beam. The PT signal is injected after each BPM buttons in order to pass along all the electronics path.



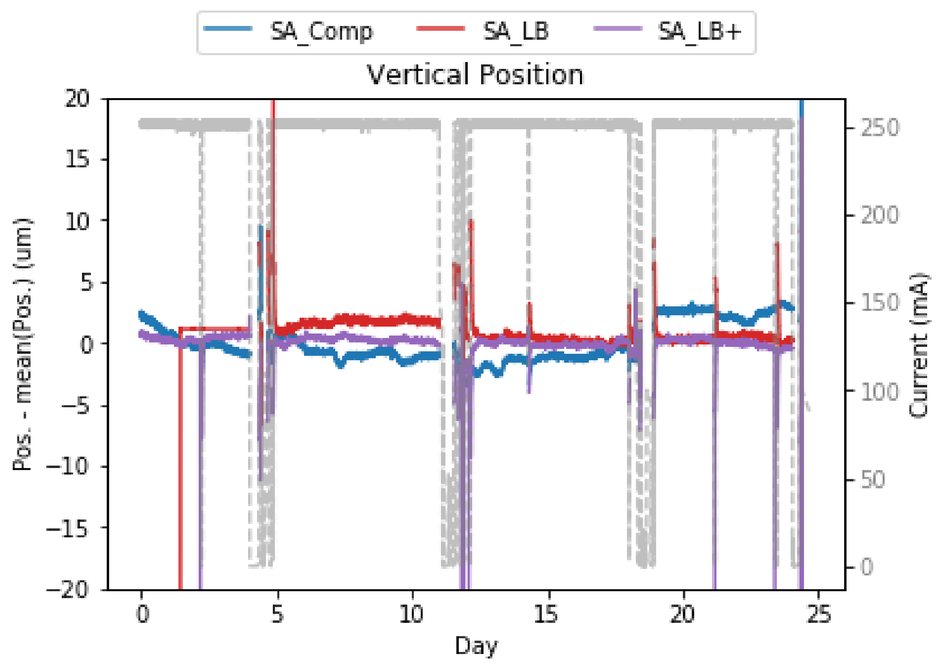
Configuration at ALBA



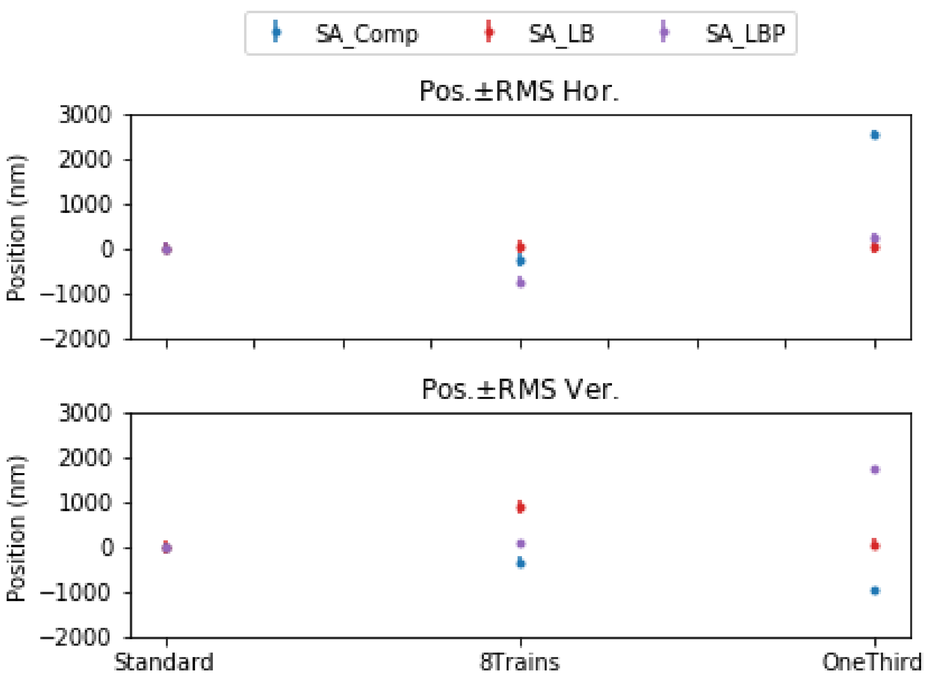
Compensation Example



User operation



Different FP - Position



Different FP - RMS

Fill. Pattern	RMS (nm)		
	Spark+PT	Brilliance	Brilliance+
Standard Hor.	121	141	123
Standard Ver.	92	143	70
8-Trains Hor.	149	147	125
8-Trains Ver.	115	153	61
1/3 Hor.	86	115	87
1/3 Ver.	70	116	82

Conclusions

A PT-Libera Spark system has been installed and tested at the ALBA storage ring. Data taken during standard operation as well as in machine days proves that the PT compensation system is performing well to cure perturbation related with the cable/electronic path. Long term data indicates a slight tendency to drift in position while the position and stability obtained in the one hour time range show performances which are comparable to the one obtained with the Libera Brilliance+.