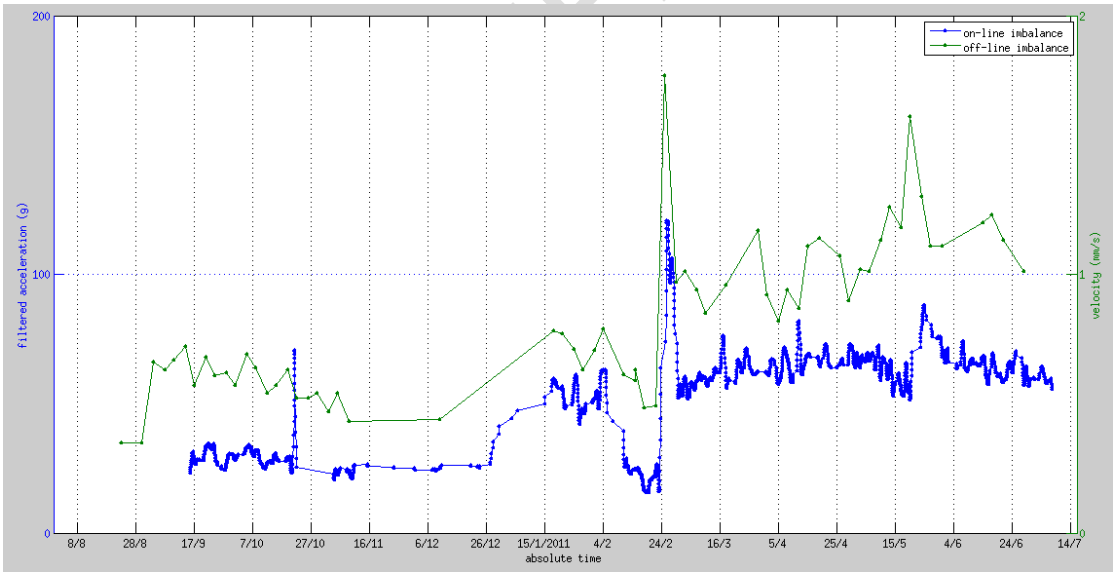
Cheap MEMS accelerometers compete with expansive piezoelectric accelerometers for detection of bearings faults / failures

The POM2 project (Prognostics for Optimal Maintenance, www.pom2sbo.org), aims to develop an integrated methodology for implementing **Pred**ictive **M**aintenance (**PdM**) on industrial machines and software tools / algorithms to support the assessment of cost / benefits ratio of the predictive maintenance.

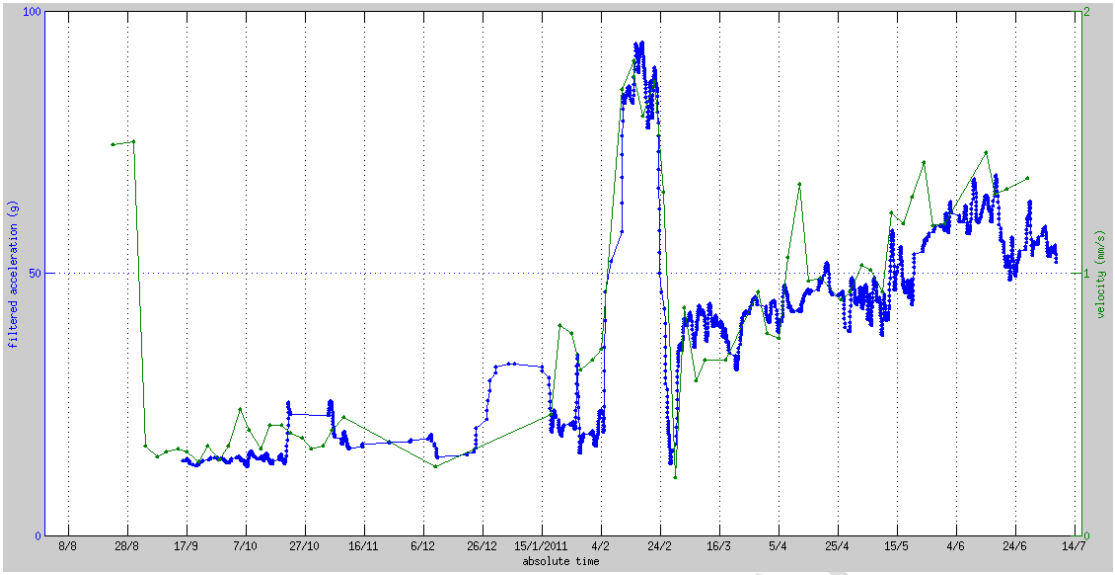
In this context, cost-effective **C**ondition **M**onitoring (**CM**) systems are needed to adopt practically a **Pred**ictive **M**aintenance (**PdM**) program in an industry. The MEMS accelerometers become more and more reliable with an advantage of a cheap price allowing industry to use them more and more for online monitoring.

In this article we will show comparison of acceleration signals recorded by a 'high-end' accelerometer used by an expensive hand-held monitoring system and a cheap MEMS accelerometer mounted for an online monitoring of bearings in steel production machines.

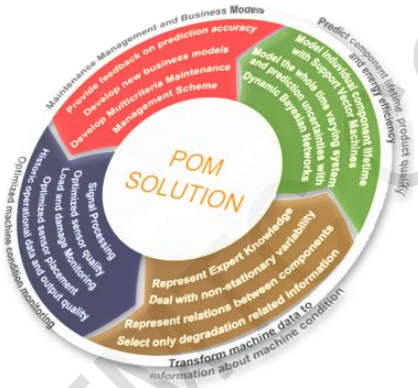
The graph below shows a 'relative' comparison of acceleration recorded by a MEMS accelerometer and velocity recorded by a 'high-end' accelerometer to monitor imbalance in bearings. The velocity signal is logged occasionally with a hand-held monitoring system while the acceleration signal is recorded through an online monitoring system. The MEMS accelerometer signal shows clearly the same trend showed by the high-end accelerometer signal.



Comparison between the same signals is made in another machine where the results are shown in the graph below.



This case study shows clearly the ability of MEMS accelerometers to log signals as good as a high-end accelerometers and therefore allowing them to be used as condition monitoring systems in a PdM program in order to predict different failures of rotary machines. The price of such monitoring systems is the driving factor to convince industrial managers to adopt this kind of PdM instead of the current way of practices.



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