Phase I control charts based on bootstrap estimates

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The control charts, introduced by Shewhart in 1924, are one of the main tools in SPC, but their domain has been successively enlarged, with applications to areas as diverse as Health, Medicine, Genetics, Biology, Environmental Sciences, Finance, Sports and Justice, among others. To develop any control chart the nominal process parameters must be either assumed known or estimated. In practice the distribution of the process data as well as the process parameters are usually unknown, being the process parameters usually estimated from an in-control historical data set (called a Phase I reference sample, being made up of m subgroups of size n) before proceed to the building of a (non-)parametric control chart. In the talk we will discuss the real performance of control charts implemented on the basis of estimated parameters and we investigate the benefits of using resampling methodologies in Phase I of control charting to estimate the nominal process parameters, together with the use of robust estimates.