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SELECTION OF OPTIMAL REGRESSION MODELS FOR INSTRUMENT CALIBRATION

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Instrument calibration is an integral part of many physical and chemical measurement systems. Commonly, instrument response is plotted against a series of known values (standards) of the measurand to establish a calibration line by linear regression. For example, the relationship is established between emitted light intensity versus concentration in Emission Spectrometry, or ion counts against concentration in quantitative Mass Spectrometry. In the simplest and ideal situation, signal intensity is assumed to be directly proportional to the concentration. In reality, however, significant errors can originate from uncertainty of the measurement, as well as non-linear dependence of the response within the chosen dynamic range. In this presentation, we will discuss about the selection of optimal calibration models and evaluate their relative effectiveness using simulated and practical examples.

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