capillaries of the instrument. In some embodiments, a run is stopped, paused, pressure is increased or decreased, warning signals sent, or one or more various other actions taken if measured pressure parameters indicate run quality might be compromised based on pressure.

[0007] In some embodiments, one or more current noise metrics are determined based on current measurements during a sample run. In some embodiments, actions are taken during a sample run if predetermined current noise metrics are exceeded.

[0008] That existing calibration methods require a separate runtime operation of an instrument is disruptive to the user and reduces productivity. This can also lead to calibration not being done often enough to ensure optimal results. Embodiments of the present invention provide instruments, computer systems, computer program products, and methods for automatic correction of spectral error during the instrument's normal runtime operation without requiring the user to conduct a special, separate calibration run. In other words, in certain embodiments, an end user does not have to perform a separate manual spectral calibration, making this a calibration-less instrument from an end user's perspective. In other embodiments, the need to perform separate runtime or pre-run calibrations is reduced by the use of in-run calibration or other correction of spectral error.

[0008a] According to an embodiment, a method comprises providing a sample containing one or more biological molecules; performing a process or assay on the sample; while performing the process or assay, detecting the one or more biological molecules within a detection zone; before or during detecting, measuring two or more parameters associated with the process or assay; and performing an action based on one or more measured values of the two or more parameters; wherein the two or more parameters comprises two or more of: a parameter indicative of a sensed value of a pressure associated the process or assay, a parameter indicative of a sensed value of a spectrum of at least one biological molecule within the detection zone, a parameter indicative of a sensed value of a temperature associated the process or assay, and a parameter indicative of a current associated with a medium carrying the at least one biological molecule.

[0008b] According to another embodiment, a method comprises providing a sample solution containing one or more biological sample molecules; performing a process or assay on the sample solution; while performing the process or assay, detecting the one or more biological molecules; before or during detecting, measuring a first system parameter; before or during detecting, measuring a second system parameter; performing an analysis on at least some measurements of at least one of the first system parameter and the second system parameter; and before or during detecting, performing an action based on the analysis.

[0008c] According to another embodiment, a sample analysis system comprises a first plurality of sensors to detect one or more system parameters during polymer loading, but prior to sample loading and detection; a second plurality of sensors to detect one or more system parameters during at least one of sample loading and sample detection; a processor; and a memory coupled to the processor and including computer program instruction for configuring the processor to analyze data from the first plurality of sensors and the second plurality of sensors to determine, prior to the end of sample detection, whether to perform and to perform an action based on the analysis.

[0008d] There is also disclosed a system for use in analyzing dye-labeled samples, the system comprising a sample processing instrument; a processor; and a memory encoded with instructions for carrying out the analysis steps as described above.

[0008e] There is also disclosed system for use in analyzing dye-labeled samples, the system comprising a sample separation instrument; a processor; and a memory encoded with instructions for carrying out the analysis steps as described above.

[0008f] There is also disclosed a system for use in analyzing dye-labeled samples, the system comprising a capillary electrophoresis instrument comprising a plurality of capillaries; a processor; and a memory encoded with instructions for carrying out the analysis steps as described above.

[0009] Various other aspects of the inventive subject matter will become more apparent from the following description, along with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 illustrates a sample separation and identification instrument in accordance with an embodiment of the present invention.

[0011] FIG. 2 illustrates an exemplary method in accordance with an embodiment of the invention to carry out runtime correction of spectral error in the instrument of FIG. 1.

[0012] FIG. 3 illustrates an exemplary method in accordance with an embodiment of the invention to carry out runtime correction of spectral error in the instrument of FIG. 1.