

## ***Despiking in Low to Midsize Raman Maps Using Geostatistic Modelling***

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Scanning an area with a Raman spectrometer requires a longer duration of time during which the detector can be hit by high-energy cosmic radiation that causes spikes to appear in the data set. A manual audit and correction of the measurements can prove time-consuming, showing the need for an automatic screening of the data. Existing methods have been created for the case of maps containing at least a thousand data points [1] or for measurements, where all points lie on a regular grid [2]. While the last assumption is usually valid in practice, the technique is limited when it comes to diagonal scans and shows weaknesses on the borders of maps. We investigate the use of geostatistical methods [3] that were designed to be robust against outliers. The spatial relationship of neighbouring points can be used to build regression and interpolation models without having to rely on grid structures. In the case of kriging, one can derive the best linear unbiased estimator of the data. This can be used to optimally impute invalid data points such as wavenumbers corrupted by spikes. For comparison, the method is shown to work well and competitive to the existing ones on a Raman scan of yeast cells [4], as well as smaller size scans.

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### References

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