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# EDR Analysis

## Seven orders of dynamic range

With the new, patented EDR analyser technology it is now possible to extend the dynamic range of TOF-SIMS and record intensities of more than 100 ions per pulse and mass interval with excellent linearity and reproducibility. The maximum count rate is no longer limited by the single ion counting.

The EDR unit located inside the analyser can redirect secondary ions of a specific mass through an attenuator before reaching the detector.
The measured intensity is then multiplied by the attenuation factor.

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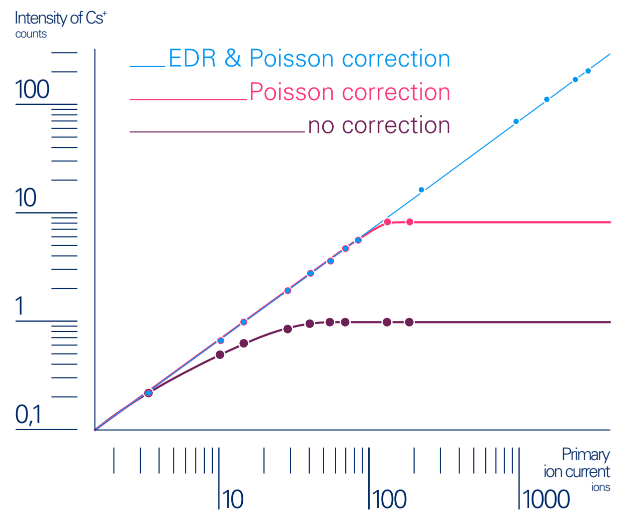
# Higher dynamic range with EDR technology

For quantitative SIMS measurements it is essential that the detection system gives a linear response even at higher count rates.
The measurement below shows the $Cs^+$ intensity with different primary ion currents.
It can clearly be seen that without any counting correction only very small primary ion currents can be used before a nonlinear response is observed.
With the established Poisson correction the range can be extended by a factor of 6-7.
The IONTOF EDR technology extends this range by a further factor of 100.

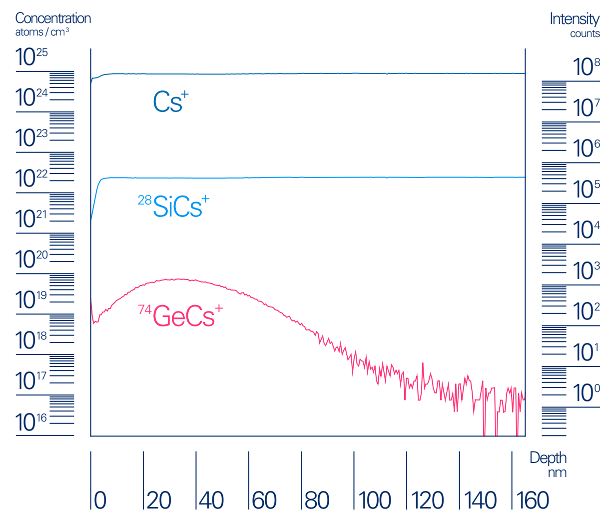



Detector response with increasing primary ion intensity using no correction, Poisson correction and EDR with Poisson correction.

# Ideal setup for $MCs^+$ depth profiling

The EDR technology is especially useful for $MCs^+$ depth profiling applications.

The $MCs^+$ mode has become very popular in TOF-SIMS as it provides improved quantification of sample composition. With EDR technology it is now possible to linearly measure very high $Cs^+$ signal intensities. Normalisation to the $Cs^+$ signal allows for the elimination of matrix effects and thereby achieves improved quantification especially when multilayer systems are analysed.




$MCs^+$ depth profile of a 40 keV germanium implant in silicon