

## Monte Carlo

Monte Carlo methods solve problems by application of random numbers, for example the number  $\pi/4$  can be calculated by generating pairs of random numbers in the interval  $[(-1/-1);(+1/+1)]$  and calculating the ratio between the number of pairs within the unit circle and the total number of shots.

PicoQuant Software makes use of Monte Carlo methods mainly as a means of finding initial values for [fitting](#) parameters before optimisation by a [Marquardt-Levenberg](#) algorithm. The principle is simple: A large number of random parameter sets is generated, for each one a [chi square](#) is calculated and the best one is taken as the initial parameter set.

The second application is [error analysis](#), namely the [bootstrap method](#).

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