Monte Carlo

Monte Carlo methods solve problems by application of random numbers, for example the number π/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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