

Interval estimation of bounded parameters

We consider the construction of interval estimates for the parameters with one-sided constraints. We show that the so-called method of sensitivity limit yields a correct solution of the problem [1]. Derived are the solutions for the cases of a continuous distribution with non-negative estimated parameter and a discrete distribution, specifically a Poisson process with background. For both cases, the best upper limit is constructed that accounts for the a priori information. Particular applications to the neutrino mass measurements, rare processes (neutrinoless double beta-decay etc.) searches and cosmic ray studies are discussed.

[1] A.V. Lokhov, F.V. Tkachov. Confidence intervals with a priori parameter bounds // Phys.Part.Nucl. 46 (2015) 347-365

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