



Asymptotic normality and efficiency of two Sobol index estimators

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Many mathematical models involve input parameters, which are not precisely known. Global sensitivity analysis aims to identify the parameters whose uncertainty has the largest impact on the variability of a quantity of interest (output of the model). One of the statistical tools used to quantify the influence of each input variable on the output is the Sobol sensitivity index. We consider the statistical estimation of this index from a finite sample of model outputs: we present two estimators and state a central limit theorem for each. We show that one of these estimators has an optimal asymptotic variance. We also generalize our results to the case where the true output is not observable, and is replaced by a noisy version.

Subjects: **Statistics Theory (math.ST)**; Applications (stat.AP); Computation (stat.CO)

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