The evaluation of uncertainty in mass calibration: possible approaches in a comparison study

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Abstract. In this paper we give the results of four methods of calculating uncertainty associated with a mass calibration problem, three based on different implementations – the first and second order law of propagation of uncertainty and the Monte Carlo method – of the general methodology described by the Guide to the Expression of Uncertainty in Measurement. the fourth based on a Bayesian formulation. The nonlinearities present in the model for the calibration problem means that the first order approach can be an unreliable method for evaluating uncertainties, relative to the other three approaches.