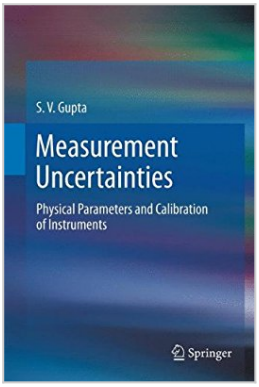

Measurement Uncertainties: Physical Parameters and Calibration of Instruments

By S. V. Gupta

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This book fulfills the global need to evaluate measurement results along with the associated uncertainty. In the book, together with the details of uncertainty calculations for many physical parameters, probability distributions and their properties are discussed. Definitions of various terms are given and will help the practicing metrologists to grasp the subject. The book helps to establish international standards for the evaluation of the quality of raw data obtained from various laboratories for interpreting the results of various national metrology institutes in an international inter-comparisons. For the routine calibration of instruments, a new idea for the use of pooled variance is introduced. The uncertainty calculations are explained for (i) independent linear inputs, (ii) non-linear inputs and (iii) correlated inputs. The merits and limitations of the Guide to the Expression of Uncertainty in Measurement (GUM) are discussed. Monte Carlo methods for the derivation of the output distribution from the input distributions are introduced. The Bayesian alternative for calculation of expanded uncertainty is included. A large number of numerical examples is included.

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From the Back Cover
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About the Author
CV supplied by the author: I have been connected with metrology for the last 56 years. I have 37 years of experience in measurement science at the National Physical Laboratory (NPL), New Delhi, India. I am among the first to write about uncertainty in measurements and Glossary of Metrological terms-documents of the Commonwealth Sciences Council CSC(80) MS-8 and various papers in Indian an International journals. I retired from National Physical Laboratory from the post of Scientist in-charge Mass, Volume, Density and Viscosity measurements in 1991. I have served various countries like Cyprus, Syria, Kuwait, Vietnam and Oman as UNIDO advisor and established their measurement laboratories and trained the staff of concerned department in measurement science. I have also served as Director Weights and Measures (Legal Metrology) for a few years and brought the Standards of Weights and Measures (W&M) Act 1976 and developed various sub-ordinate legislations for effective implementation of the Act. Many neighboring and gulf countries have the Weights and Measures Acts based on India’s W&M ACT of 1976. I am in constant touch with leading Metrology Laboratories of the world. B Academics: I am M.Sc. (Physics); M.Sc. (Mathematics); Ph.D. (Physics) with very good academic records.

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