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Application of a Bayesian tomography method to the line-integrated measurements in fusion plasmas[1] DONG LI, Southwestern Institute of Plasma Physics, ChengDu, Sichuan, 610041, China, JACKOB SVENSSON, Max Planck Institute for Plasma Physics, Teilinstitut, D-17491 Greifswald, Germany, TIAN BO WANG, Institute for Magnetic Fusion Research, CEA, F-13115 Saint-Paul-lez-Durance, France, YUN BO DONG, WEI DENG, Southwestern Institute of Plasma Physics, ChengDu, Sichuan, 610041, China — Bayesian probability theory is now widely used for data analysis in fusion diagnostics where uncertainty analysis and consistency check are of particular importance. In Bayesian formalism, the quantities of interest are expressed in the probabilistic form rather than a single determined solution, as a consequence, the uncertainty of the result can be acquired from the confidence interval of a posterior probability. Moreover, validity of the result can be checked by examining whether the misfits between predicted and measured data are within an assumed data error. In this article, we introduce a Bayesian tomography method using non-stationary Gaussian Processes to adapt locally to the varying smoothness in space, through which the accuracy of reconstructions can be improved significantly. To date, this Bayesian tomography method has been applied to diagnostics in several fusion devices: soft X-ray in W7-AS and HL-2A, bolometer in JET and soft X-ray spectroscopy in WEST, being used favorably for the study of relevant physics.

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