

BAYESIAN ESTIMATION IN DAM MONITORING NETWORKS

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Summary: A Bayesian estimator with informative prior distributions (a multi-normal and an inverted gamma distribution), adequate to displacement estimation at dam monitoring networks, is presented. The hyper-parameters of the prior distributions are obtained by Bayesian empirical methods with non-informative priors. The performances of the Bayes estimator and the classical generalized least squares estimator are compared using two measurements of the horizontal monitoring network of a concrete gravity dam: the Penha Garcia dam (Portugal). In order to test the robustness of the two estimators, gross errors are added to one of the measured horizontal directions: the Bayes estimator proves to be significantly more robust than the generalized least squares estimator.