RANGE OF THE POSTERIOR PROBABILITY OF AN INTERVAL FOR PRIORS WITH UNIMODALITY PRESERVING CONTAMINATIONS

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Abstract. Range of the posterior probability of an interval over the ϵ-contamination class $\Gamma = \{\pi = (1-\epsilon)\pi_0 + \epsilon q : q \in Q\}$ is derived. Here, π_0 is the elicited prior which is assumed unimodal, ϵ is the amount of uncertainty in π_0, and Q is the set of all probability densities q for which $\pi = (1-\epsilon)\pi_0 + \epsilon q$ is unimodal with the same mode as that of π_0. We show that the sup (resp. inf) of the posterior probability of an interval is attained by a prior which is equal to $(1-\epsilon)\pi_0$ except in one interval (resp. two disjoint intervals) where it is constant.

Key words and phrases: Posterior probability, unimodality preserving contaminations, Bayesian robustness.