STEIN-TYPE IMPROVEMENTS OF CONFIDENCE INTERVALS FOR THE GENERALIZED VARIANCE

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Abstract. Based on independent random matices X: $p \times m$ and S: $p \times p$ distributed, respectively, as $N_{pm}(\mu,\ \Sigma \otimes I_m)$ and $W_p(n,\ \Sigma)$ with μ unknown and $n \geq p$, the problem of obtaining confidence interval for $|\Sigma|$ is considered. Stein's idea of improving the best affine equivariant point estimator of $|\Sigma|$ has been adapted to the interval estimation problem. It is shown that an interval estimator of the form $|S|(b^{-1},\ a^{-1})$ can be improved by $\min\{|S|,\ c|S + XX'|\}(b^{-1},\ a^{-1})$ for a certain constant c depending on $(a,\ b)$.

Key words and phrases: Generalized variance, invariant interval estimators, Stein-type improvements.