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Correction to "Comparison of A-Posteriori Parameter Choice Rules for Linear Discrete Ill-Posed Problems" [J. Comput. Appl. Math., in press.]

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Abstract

In Proposition 1 in the above paper $\mu_3 \leq \mu_2$ should be replaced by $\mu_3 \geq \mu_2$.

Correct formulation of Proposition 1 in [1]:

Proposition 1. *Let μ_j be the unique solution of $\phi_j(\mu) = \eta^2\epsilon^2$ for $j \in \{2, 3\}$. Then $\mu_3 \geq \mu_2$. Generally, the inequality is strict.*

Proof. The function

$$p \to \frac{\widetilde{b}_j^2}{(\sigma_j^2/\mu + 1)^p}$$

is decreasing. Therefore, for fixed $\mu > 0$, $\phi_3(\mu) \leq \phi_2(\mu)$. The inequality is strict if $\widetilde{b}_j\sigma_j \neq 0$. The function

$$\mu \to \frac{\widetilde{b}_j^2}{(\sigma_j^2/\mu + 1)^p}$$

is increasing. In order for $\phi_2(\mu_2) = \phi_3(\mu_3)$, we must have $\mu_3 \geq \mu_2$. The inequality is strict if $\widetilde{b}_j\sigma_j \neq 0$ for at least one index $1 \leq j \leq n$. □

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References

[1] A. Buccini, Y. Park, and L. Reichel, Comparison of A-Posteriori Parameter Choice Rules for Linear Discrete Ill-Posed Problems, J. Comput. Appl. Math., in press.