CORRIGENDA

A. J. HUGHES HALLETT, "The convergence of accelerated overrelaxation iterations," *Math. Comp.*, v. 47, 1986, pp. 219–223.

I am grateful to A. K. Yeyios for pointing out that Theorem 2 is not strictly correct. It stated conditions sufficient to ensure the relevant necessary conditions for the convergence of an AOR process are satisfied, but not conditions which are themselves strictly necessary. Consequently, the statement of the theorem needs to be corrected as follows.

THEOREM 2. *If AOR iterations are convergent for $\alpha, \gamma \neq 0$, then the parameters α, γ satisfy*

$$|\gamma(1-\alpha)| < |\alpha| + |\gamma - \alpha| \tag{1}$$

or, equivalently, belong to the respective intervals in one of the following cases:

(i) $\alpha \in (0,2)$, $\gamma \in (-\infty, 0) \cup (0, +\infty)$,

(ii) $\alpha \in (-\infty, 0) \cup [2, +\infty)$, $\gamma \in (2\alpha/(2-\alpha), 0) \cup (0, 2)$.

Proof. Let $G_{\alpha,\gamma} = (I - \alpha L)^{-1}[(1-\gamma)I + (\gamma - \alpha)L + \gamma U]$ have eigenvalues μ_j, $j = 1, 2, \ldots, n$. We have

$$|G_{\alpha,\gamma} - (1-\beta)I| = \prod_{j=1}^{n}(\mu_j - (1-\beta)) = |\beta\alpha U + \beta(1-\alpha)I| = \beta^n(1-\alpha)^n,$$

where $\beta = \gamma/\alpha$. But, if $\rho(G_{\alpha,\gamma}) < 1$ where $\rho(\cdot)$ denotes spectral radius, then

$$\left|\prod_{j=1}^{n}(\mu_j - (1-\beta))\right| \leq \prod_{j=1}^{n}\{|\mu_j| + |1-\beta|\} < \prod_{j=1}^{n}\{1 + |1-\beta|\} = [1 + |1-\beta|]^n,$$

which implies $|\beta(1-\alpha)| < 1 + |1-\beta|$, that is, (1). It is now elementary to verify that (1) is equivalent to α, β satisfying either (i) or (ii) of Theorem 2.

The remaining theorems in this paper are unaffected by this correction.

The necessary condition (1) for convergence, and its equivalence to (i), (ii), were kindly pointed out to us by A. K. Yeyios.

A. J. HUGHES HALLETT

Department of Economics
University of Newcastle
Newcastle-upon-Tyne NE1 7RU, England

JAMES H. BRAMBLE & JOSEPH E. PASCIAK, "A preconditioning technique for indefinite systems resulting from mixed approximations of elliptic problems," *Math. Comp.*, v. 50, 1988, pp. 1–17.

Please make the following corrections.

Display (1.3) should read

$$(1.3)\qquad \begin{aligned}(BA^{-1}B^*V,V) = (AA^{-1}B^*V, A^{-1}B^*V) &= \sup_{U\in S^1} \frac{(AA^{-1}B^*V,U)^2}{(AU,U)} \\ &= \sup_{U\in S^1} \frac{(V,BU)^2}{(AU,U)}.\end{aligned}$$

Display (1.4) should read

$$(1.4)\qquad \sup_{U\in S^1} \frac{(V,BU)^2}{(AU,U)} \geq c\|V\|^2 \quad \text{for all } V \in S^2,$$

and display (3.14) should read

$$(3.14)\qquad \inf_{Q\in\Pi_h} \sup_{\mathbf{V}\in\mathbf{H}_h} \frac{(Q,\nabla\cdot\mathbf{V})}{\|\mathbf{V}\|_1\|Q\|} \geq c.$$

On page 9, the first part of the proof should read

Proof. We only need to estimate the condition number of M. By Theorem 1, it suffices to show that there are positive constants c_0 and c_1 not depending on h satisfying

$$c_0\|Q\|^2 \leq ((C+BA^{-1}B^*)Q,Q) \leq c_1\|Q\|^2 \quad \text{for all } Q \in \Pi_h.$$

The form $\overline{A}(\cdot,\cdot)$ is equivalent to $\|\cdot\|_1^2$ on $\mathbf{H}_h$. We have by (1.3) and (3.14) that

$$\begin{aligned}((C+BA^{-1}B^*)Q,Q) &= \gamma\|Q\|^2 + \sup_{\mathbf{V}\in\mathbf{H}_h} \frac{(Q,\nabla\cdot\mathbf{V})^2}{\overline{A}(\mathbf{V},\mathbf{V})} \\ &\geq c_0\|Q\|^2.\end{aligned}$$

Display (5.1) should read

$$(5.1)\qquad \inf_{Q\in\tilde{\Pi}_h} \sup_{V\in\mathbf{H}_h} \frac{(Q,\nabla\cdot V)}{\|V\|_{H^1(\Omega)}\|Q\|_{L^2(\Omega)}} \geq c > 0$$

These errors resulted from a computer malfunction, and we apologize for the inconvenience.