CORRIGENDUM

J. M. Bownds, "On solving weakly singular Volterra equations of the first kind with Galerkin approximations," *Math. Comp.*, v. 30, 1976, pp. 747–757.

Regarding [1], the basic assumption that $k(x, t) \equiv 0$ for $x < t$ can be dropped, and the statement of Theorem 1 should be changed to read as follows.

THEOREM 1. *Under the present assumptions, if* $\operatorname{col}(y_1, y_2, \ldots, y_n)$ *satisfies the initial-value problem,*

$$(4) \qquad \begin{aligned} y_j'(x) &= \psi_j(x)u_n(x), \qquad 0 < x \leqslant 1, \\ y_j(0) &= 0, \end{aligned}$$

where $\psi_1(t), \psi_2(t), \ldots, \psi_n(t)$ *solve the linear system*

$$(5) \qquad \sum_{j=1}^{n} \left(\int_t^1 \phi_l(x)\phi_j(x)\,dx \right) \psi_j(t) \equiv \int_t^1 \frac{\phi_l(x)K(x, t)\sin \pi\alpha}{\pi k(x, x)}\,dx,$$

$j = 1, 2, \ldots, n$, *and* ϕ_j, u_n *are as above, then* $\langle \delta_n, \phi_l \rangle = 0$ *for* $1 \leqslant l \leqslant n$; k_1 *denotes differentiation of* $k(x, t)$ *with respect to* x.

If the original second kind equation was of Fredholm type, then the integrals in (5) would have limits $x = 0$ to $x = 1$ instead of $x = t$ to $x = 1$, and so in such a case, (5) would have the obvious solution given by the Fourier coefficients,

$$\psi_j(t) = \frac{\sin \pi\alpha}{\pi} \int_0^1 \frac{K(x, t)}{k(x, x)} \phi_j(x)\,dx, \qquad j = 1, 2, \ldots, n.$$

This change also must be made in the statement of Theorem 2 as follows.

THEOREM 2. *If* $\operatorname{col}(y_1, y_2, \ldots, y_n)$ *satisfies* (4) *and if* $\overline{\psi}_j(t)$, $j = 1, 2, \ldots, n$, *approximates a solution* $\psi_j(t)$, $j = 1, 2, \ldots, n$, *of* (5), *then*

$$(7) \qquad \langle \delta_n, \phi_l \rangle = \int_0^1 E_l(t)\,dt, \quad 1 \leqslant l \leqslant n,$$

where

$$E_l(t) = \int_t^1 \left(\sum_{j=1}^{n} \phi_j(x)\overline{\psi}_j(t) - \frac{K(x, t)\sin \pi\alpha}{\pi k(x, x)} \right) \phi_l(x)\,dx,$$

$l = 1, 2, \ldots, n$, $0 \leqslant t \leqslant 1$.

Remarks. The point of the above changes is that the Fourier coefficients do not produce a zero projection $\langle \delta_n, \phi_l \rangle$ as originally indicated. In point of fact, the author has found, however, that these coefficients nevertheless supply accurate approximations for use in solving second kind equations of the form considered in the paper if the basis functions are chosen as Legendre or Chebyshev polynomials. More details on this approach and several numerical examples are forthcoming.

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1. J. BOWNDS, "On solving weakly singular Volterra equations of the first kind with Galerkin approximations," this journal, v. 30, 1976, pp. 747–757.