

Erratum to: Fast Computing of Conformal Mapping and Its Inverse of Bounded Multiply Connected Regions onto Second, Third and Fourth Categories of Koebe's Canonical Slit Regions

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The authors regret that few corrections were inadvertently omitted from the original paper. It is now included with this erratum.

We would like to note the following corrections:

- Under Section 2, Line 36, 3rd integral operator \mathbf{N}^* should be like

$$\mathbf{N}^*\psi(t) = \int_J N^*(t, s)\psi(s)ds, \quad t \in J.$$

- Under Section 7, “Numerical Implementation” Lines 10–15 should change to
The integral equation (49) can be written as

$$\int_J -N_k(s, t)dtS'(t) + \int_J N^*(s, t)S'(s)ds + \mathbf{J}S' = \tilde{\psi}(t), \quad (62)$$

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where $N_k(s, t) = \frac{1}{\pi} \text{Im} \left(\frac{z'(t)}{z(t) - z(s)} \right)$,

Discretizing integral equation (62) gives

$$\begin{aligned} & \frac{-2}{n} \sum_{\substack{\bar{j}=1 \\ \bar{k} \neq \bar{j}}}^{(M+1)n} \text{Im} \left[\left(\frac{z'(t_{\bar{j}})}{z(t_{\bar{k}}) - z(t_{\bar{j}})} \right) S'(t_{\bar{k}}) \right] \\ & + \frac{2}{n} \sum_{\substack{\bar{j}=1 \\ \bar{k} \neq \bar{j}}}^{(M+1)n} \text{Im} \left[\left(\frac{\hat{A}(t_{\bar{j}}) S'(t_{\bar{j}})}{z(t_{\bar{k}}) - z(t_{\bar{j}})} \right) \left(\frac{z'(t_{\bar{k}})}{\hat{A}(t_{\bar{k}})} \right) \right] \\ & + \frac{2}{n} \left(\frac{1}{2} \text{Im} \frac{z''(t_{\bar{k}})}{z'(t_{\bar{k}})} - \text{Im} \frac{\hat{A}'(t_{\bar{k}})}{\hat{A}(t_{\bar{k}})} \right) S'(t_{\bar{k}}) + \frac{1}{n} \sum_{\bar{j}=1}^{(M+1)n} \chi(t_{\bar{j}}) \chi(t_{\bar{k}}) S'(t_{\bar{j}}) = \tilde{\psi}(t_{\bar{k}}). \end{aligned} \tag{63}$$

- Equation (64) should change to

$$(G)_{\bar{k}\bar{j}} = \begin{cases} \frac{1}{z(t_{\bar{k}}) - z(t_{\bar{j}})}, & k \neq j, \\ 0, & k = j. \end{cases} \tag{64}$$

- Equation (65) should change to

$$\begin{aligned} & \frac{-2}{n} \text{Im} [(S'(\mathbf{t}) [Gz'(\mathbf{t})])] + \frac{2}{n} \text{Im} \left[\left(\frac{z'(\mathbf{t})}{\hat{A}(\mathbf{t})} \right) [G(\hat{A}(\mathbf{t})) S'(\mathbf{t})] \right] \\ & + \frac{2}{n} \left(\frac{1}{2} \text{Im} \frac{z''(\mathbf{t})}{z'(\mathbf{t})} - \text{Im} \frac{\hat{A}'(\mathbf{t})}{\hat{A}(\mathbf{t})} \right) S'(\mathbf{t}) + \mathbf{y} = \tilde{\psi}(\mathbf{t}). \end{aligned} \tag{65}$$

- Under Section 7, Line 24, should change to “Let the $(M + 1)n \times 1$ vector \mathbf{p} be the vector $(\hat{A}(\mathbf{t})) S'(\mathbf{t})$ or $z'(\mathbf{t})$. Let also \mathbf{a} be $2 \times (M + 1)n$ real vector”
- For the acknowledgment, we wish to add a sentence on the second last line “The authors gratefully acknowledge Prof. Mohamed. M. S. Nasser for helpful discussion related to Section 7.”