Nonlinear Dynamics **35:** 201–203, 2004.

Errata

HUAILEI WANG and HAIYAN HU / Remarks on the Perturbation Methods in Solving the Second-Order Delay Differential Equations, *Nonlinear Dynamics* **33**(4), 2003, 379–398.

In the above-mentioned article, a number of errors occurred. The corrections are as follows. The Publisher regrets any inconvenience caused.

1. In the 10th line on page 381, 'It easy to prove that and.' should be 'It is easy to prove that $\omega_1 < \omega_0$ and $\omega_2 > \omega_0$.'
2. Equation (17)
$$\left(ic\omega\tau + \omega_0^2\tau + i\omega + \frac{i\omega_0^2}{\omega}\right) D_1 A + 3A^2\bar{A} = 0$$
should be
$$\left(ic\omega\tau + \omega_0^2\tau - \omega^2\tau + i\omega + \frac{i\omega_0^2}{\omega}\right) D_1 A + 3A^2\bar{A} = 0.$$
3. In the first line on page 384, 'where $\tau_0 = \tau_{1,k}$ or as in Equation (9)' should be 'where $\tau_0 = \tau_{1,k}$ or $\tau_0 = \tau_{2,k}$ as in Equation (9)'.
4. At the end of Equation (31), a full stop was omitted.
5. In the denominator of the first equation of Equation (33),
$$(\bar{\omega}^2 + \omega_0^2\tau_0^2(\bar{\omega}^2 + \omega_0^2\tau_0^2 + 2c\bar{\omega}^2\tau_0)$$
should be
$$(\bar{\omega}^2 + \omega_0^2\tau_0^2)(\bar{\omega}^2 + \omega_0^2\tau_0^2 + 2c\bar{\omega}^2\tau_0).$$
6. In Equation (46), $y_i \equiv x_i(T_0, T_1, T_2)$ should be $y_i \equiv x_i(T_0 - \tau, T_1, T_2)$.
7. In Equations (54a) and (54b), all v should be $\bar{v}$.
8. In Equation (55), all v should be $\bar{v}$.
9. In the first line and the last line of Equation (57a), all v should be $\bar{v}$.
10. In the first line of Equation (57b), v should be $\bar{v}$.
11. In Equations (59a) and (59b), all v should be $\bar{v}$.
12. In Equations (60) and (61), all v should be $\bar{v}$.
13. In the second line of Equation (67), v should be $\bar{v}$.
14. In the line above Equation (68), 'From Equation 50)' should be 'From Equation (50)'.
15. In the line above Equation (73), '$\dot{x}_0(0)$ gives' should be '$\dot{x}_0(0) = 0$ gives'.
16. The third item in the last line of Equation (80) should be $\frac{i\bar{v}\eta\sigma a_0^3 e^{-i\omega\tau}}{256\omega^3}$, where σ was missing in the printed edition of the paper.

H. SUGIYAMA, J. L. ESCALONA, and A. A. SHABANA / Formulation of Three-Dimensional Joint Constraints Using the Absolute Nodal Coordinates, *Nonlinear Dynamics* **31**(2), 2003, 167–195.

In the above-mentioned article, a number of mistakes occurred. The corrections are listed below. The Publisher regrets any inconvenience caused.

In Equation (27), the vector $\mathbf{b}_t^{ie}$ of the tangent frame must be normalized as follows:

$$\mathbf{b}_t^{ie} = \frac{\mathbf{t}_t^{ie} \times \hat{\mathbf{r}}_y^{ie}}{|\mathbf{t}_t^{ie} \times \hat{\mathbf{r}}_y^{ie}|}. \tag{27}$$

Using this correction, Equation (34) can be written as

$$\mathbf{i}^{iek} = \hat{\mathbf{r}}_X^{iek}, \quad \mathbf{k}^{iek} = \frac{\hat{\mathbf{r}}_X^{iek} \times \hat{\mathbf{r}}_Y^{iek}}{|\hat{\mathbf{r}}_X^{iek} \times \hat{\mathbf{r}}_Y^{iek}|}, \quad \mathbf{j}^{iek} = \mathbf{k}^{iek} \times \mathbf{i}^{iek}, \tag{34}$$

where $\hat{\mathbf{a}}$ denotes a unit vector along the vector $\mathbf{a}$. Using the relation $|\hat{\mathbf{r}}_X^{iek} \times \hat{\mathbf{r}}_Y^{iek}| = \sin\alpha$, the first time derivatives of $\mathbf{k}^{iek}$ and $\mathbf{j}^{iek}$ can be written as:

$$\dot{\mathbf{k}} = \frac{1}{\sin\alpha}(\dot{\hat{\mathbf{r}}}_X \times \hat{\mathbf{r}}_Y + \hat{\mathbf{r}}_X \times \dot{\hat{\mathbf{r}}}_Y) - \frac{\cos\alpha}{\sin^2\alpha}(\hat{\mathbf{r}}_X \times \hat{\mathbf{r}}_Y)\dot{\alpha}, \tag{37}$$

where the superscripts i, e and k are omitted for simplicity and α ($\alpha \neq n\pi;\, n = 0, 1, \ldots$) is the angle between the unit slope vectors $\hat{\mathbf{r}}_X$ and $\hat{\mathbf{r}}_Y$. This angle is equal to $\pi/2$ when there is no deformation within the cross-section. Since $\hat{\mathbf{r}}_X^T\hat{\mathbf{r}}_Y = \cos\alpha$, one can write

$$\dot{\alpha} = \frac{\partial\alpha}{\partial\mathbf{r}_X}\dot{\mathbf{r}}_X + \frac{\partial\alpha}{\partial\mathbf{r}_Y}\dot{\mathbf{r}}_Y,$$

where

$$\frac{\partial\alpha}{\partial\mathbf{r}_X} = \frac{-1}{\sin\alpha}\hat{\mathbf{r}}_Y^T\frac{\partial\hat{\mathbf{r}}_X}{\partial\mathbf{r}_X}, \quad \frac{\partial\alpha}{\partial\mathbf{r}_Y} = \frac{-1}{\sin\alpha}\hat{\mathbf{r}}_X^T\frac{\partial\hat{\mathbf{r}}_Y}{\partial\mathbf{r}_Y}.$$

The time derivative of the vector $\mathbf{j}$ can then be obtained as

$$\dot{\mathbf{j}} = \dot{\mathbf{k}} \times \hat{\mathbf{r}}_X + \frac{1}{\sin\alpha}(\hat{\mathbf{r}}_X \times \hat{\mathbf{r}}_Y) \times \dot{\hat{\mathbf{r}}}_X. \tag{38}$$

Furthermore, the second time derivatives of the vectors $\mathbf{k}$ and $\mathbf{j}$ can be written as

$$\begin{aligned}\ddot{\mathbf{k}} &= \frac{1}{\sin\alpha}(\ddot{\hat{\mathbf{r}}}_X \times \hat{\mathbf{r}}_Y + \hat{\mathbf{r}}_X \times \ddot{\hat{\mathbf{r}}}_Y + 2\dot{\hat{\mathbf{r}}}_X \times \dot{\hat{\mathbf{r}}}_Y) \\ &\quad - \frac{\cos\alpha}{\sin^2\alpha}\left[(\hat{\mathbf{r}}_X \times \hat{\mathbf{r}}_Y)\ddot{\alpha} + 2(\dot{\hat{\mathbf{r}}}_X \times \hat{\mathbf{r}}_Y + \hat{\mathbf{r}}_X \times \dot{\hat{\mathbf{r}}}_Y)\dot{\alpha}\right] + \frac{1+\cos^2\alpha}{\sin^3\alpha}(\hat{\mathbf{r}}_X \times \hat{\mathbf{r}}_Y)\dot{\alpha}^2 \\ &\equiv \frac{\partial\mathbf{k}}{\partial\mathbf{r}_X}\ddot{\mathbf{r}}_X + \frac{\partial\mathbf{k}}{\partial\mathbf{r}_Y}\ddot{\mathbf{r}}_Y + \mathbf{K}_d,\end{aligned} \tag{42}$$

where $\mathbf{K}_d$ includes all the quadratic velocity terms. Note that $\ddot{\alpha}$ can be written as

$$\ddot{\alpha} = \frac{\partial\alpha}{\partial\mathbf{r}_X}\ddot{\mathbf{r}}_X + \frac{\partial\alpha}{\partial\mathbf{r}_Y}\ddot{\mathbf{r}}_Y + \alpha_d,$$

where

$$\alpha_d = \frac{\partial \dot{\alpha}}{\partial \mathbf{r}_X}\dot{\mathbf{r}}_X + \frac{\partial \dot{\alpha}}{\partial \mathbf{r}_Y}\dot{\mathbf{r}}_Y.$$

The second time derivative of $\mathbf{j}$ can be obtained as

$$\begin{aligned}\ddot{\mathbf{j}} &= \ddot{\mathbf{k}} \times \mathbf{i} + \mathbf{k} \times \ddot{\mathbf{i}} + 2\dot{\mathbf{k}} \times \dot{\mathbf{i}} \\ &= \left(\frac{\partial \mathbf{k}}{\partial \mathbf{r}_X}\ddot{\mathbf{r}}_X + \frac{\partial \mathbf{k}}{\partial \mathbf{r}_Y}\ddot{\mathbf{r}}_Y\right) \times \hat{\mathbf{r}}_X + \mathbf{k} \times \frac{\partial \hat{\mathbf{r}}_X}{\partial \mathbf{r}_X}\ddot{\mathbf{r}}_X + \mathbf{J}_d,\end{aligned} \tag{43}$$

where

$$\mathbf{J}_d = \mathbf{K}_d \times \hat{\mathbf{r}}_X + \mathbf{k} \times \frac{\partial}{\partial \mathbf{r}_X}\left(\frac{\partial \hat{\mathbf{r}}_X}{\partial \mathbf{r}_X}\dot{\mathbf{r}}_X\right)\dot{\mathbf{r}}_X + 2\dot{\mathbf{k}} \times \dot{\mathbf{i}}.$$