

ERRATA TO:

STRAPDOWN ANALYTICS , SECOND EDITION

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PARTS 1 AND 2

STRAPDOWN ASSOCIATES, INC. 2007

Corrections Reported From March 2017 To Present

Page 19-23 (Part 2)

Replace the paragraph following (19.1.9-7) with:

From Eq. (19.1.9-7) with $\underline{\alpha}$ and \underline{v} from (19.1.3-6), it follows that

$$\begin{aligned} \frac{1}{6} \underline{\alpha} \times \Delta \dot{\underline{\phi}}_2 &= \frac{1}{6} \underline{\alpha} \times \left[\frac{3}{(t - t_{m-1})} \right] \Delta \underline{\phi}_2 + \dots = -\frac{1}{2} \Delta \underline{\phi}_2 \times \frac{\underline{\alpha}}{(t - t_{m-1})} + \dots \approx -\frac{1}{2} \Delta \underline{\phi}_2 \times \underline{\omega} \\ \frac{1}{6} \left(\underline{\alpha} \times \Delta \dot{\underline{\eta}}_2 - \Delta \dot{\underline{\phi}}_2 \times \underline{v} \right) &= \frac{1}{6} \left\{ \underline{\alpha} \times \left[\frac{3}{(t - t_{m-1})} \right] \Delta \underline{\eta}_2 - \left[\frac{3}{(t - t_{m-1})} \right] \Delta \underline{\phi}_2 \times \underline{v} \right\} + \dots \\ &= -\frac{1}{2} \left[\Delta \underline{\phi}_2 \times \frac{\underline{v}}{(t - t_{m-1})} - \frac{\underline{\alpha}}{(t - t_{m-1})} \times \Delta \underline{\eta}_2 \right] + \dots \approx -\frac{1}{2} \left(\Delta \underline{\phi}_2 \times \underline{a}_{SF} - \underline{\omega} \times \Delta \underline{\eta}_2 \right) \end{aligned} \quad (19.1.9-7a)$$

On substituting Eqs. (19.1.9-7a) into the $\Delta \dot{\underline{\phi}}_3$ and $\Delta \dot{\underline{\eta}}_3$ expressions in Eqs. (19.1.7-9) - (19.1.7-10), we discover that to Picard third order expansion accuracy, $\frac{1}{6} \underline{\alpha} \times \Delta \dot{\underline{\phi}}_2$ cancels $\frac{1}{2} \Delta \underline{\phi}_2 \times \underline{\omega}$ and $\frac{1}{6} \left(\underline{\alpha} \times \Delta \dot{\underline{\eta}}_2 - \Delta \dot{\underline{\phi}}_2 \times \underline{v} \right)$ cancels $\frac{1}{2} \left(\Delta \underline{\phi}_2 \times \underline{a}_{SF} - \underline{\omega} \times \Delta \underline{\eta}_2 \right)$, making $\Delta \dot{\underline{\phi}}_3$ and $\Delta \dot{\underline{\eta}}_3$ equal zero. Thus, algorithm errors $\delta \dot{\underline{\phi}}_{\text{Algo}/c}$ and $\delta \dot{\underline{\eta}}_{\text{Algo}/c}$ in (19.1.9-3) have no third order Picard expansion terms, making the $\dot{\underline{\phi}}_{\text{Algo}/c}$ and $\dot{\underline{\eta}}_{\text{Algo}/c}$ algorithms in (19.1.8-3) accurate to third order, one order more than (19.1.8-3) might imply.

Corrections Reported From February 2015 To March 2017

Page 19-20 (Part 2)

In Equation (19.1.8-5), the Δ in $\Delta \underline{\eta}_{\text{Algo}/c}$ under the integral was omitted. The corrected Equation (19.1.8-5) is as follows:

$$\zeta_{\text{Algo}/c} = \underline{S}_v + \Delta \zeta_{\text{Algo}/c} \quad \Delta \zeta_{\text{Algo}/c} = \int_{t_{m-1}}^t \left[\Delta \eta_{\text{Algo}/c} + \frac{1}{6} (\underline{\alpha} \times \underline{v} - 2 \underline{\omega} \times \underline{S}_v) \right] dt$$

Corrections Reported From June 2007 To February 2015

Page 15-37 (Part 2)

The first IF statement under the DO loop should be changed to:

IF j is less than or equal to the specified $\Phi_{\lambda y}$ expansion order, THEN:

The indentation for the last two lines in the DO loop should be the same as for the preceding line:

$$\begin{aligned} \text{IF } j \text{ is equal to the specified } \Phi_{\lambda y} \text{ expansion order: } \quad B &= \Phi_{\lambda y} \Phi_{\lambda \lambda}^T \\ M_{\lambda \lambda}^j &= M_{\lambda \lambda}^{j-1} \Delta \Phi_{\lambda \lambda m} \\ \Phi_{\lambda \lambda}^j &= \Phi_{\lambda \lambda}^{j-1} + \frac{1}{j!} M_{\lambda \lambda}^j \end{aligned}$$

The indentation of the ENDDO statement should be the same as for the DO statement.

Page 15-135 (Part 2)

The parameter definition at the bottom of the page should be:

$$\Delta \underline{v}_{SF_n}^N = \text{Equivalent to velocity change produced by specific force acceleration since the start of alignment.}$$