which is a drastically different result. In the same manner, if one lets $\Omega = \omega_k$ in (4), the following results:

$$\left\{ \frac{2\zeta_j}{[(\zeta_k/\zeta_j)^2(\beta^2-1)^2+4\zeta_k^2\beta^2]^{1/2}} \right\}^{1/2} \left| \frac{\xi_{kj}}{\xi_{jj}} \right| \ll 1 \qquad (7)$$

Whenever $\zeta_j = \zeta_k$, the inequalities of (5) and (7) are identical. Otherwise they are not identical, and the statement immediately preceding Eq. (12) of Ref. 1 is not strictly true. Whenever $\zeta_j > \zeta_k$, assuming $\omega_j < \omega_k$, (7) should be applied in lieu of (5) (since the requirement of the latter is the more severe). The writer therefore is appreciative of this opportunity to modify the criterion offered in Ref. 1.

In any case, both of the inequalities (2) and (6), which follow from Flax's approach, are believed to be inappropriate. In the notation of Ref. 1,

$$[I+\tilde{Z}_n]H_\gamma = P_\gamma; \qquad H_\gamma = [I+\tilde{Z}_n]^{-1}P_\gamma$$

For small $\tilde{Z}_n$, it can be shown [Eq. (4A) of Ref. 2] that

$$[I+\tilde{Z}_n]^{-1} \approx [I-\tilde{Z}_n]$$

Transformation of H_γ to H_q yields

$$H_q = Z_d^{-1/2}[I-\tilde{Z}_n]Z_d^{-1/2}P_q \qquad (8)$$

Recalling that $\tilde{Z}_n = Z_d^{-1/2}Z_nZ_d^{-1/2}$, we find that

$$H_q = (Z_d^{-1} - Z_d^{-1}Z_nZ_d^{-1})P_q \qquad (9a)$$

$$H_q = (I - Z_d^{-1}Z_n)Z_d^{-1}P_q \qquad (9b)$$

Flax's criterion is equivalent to the inequality

$$|e_k^T Z_d^{-1}(i\omega_j)Z_n(i\omega_j)e_j| \ll 1 \qquad (10)$$

which may be inferred from Eq. (9). Contrast this with the inequality (4) derived from Eq. (8). If Flax's criterion (10) were to be used, it would seem that

$$|e_j^T Z_d^{-1}(i\omega_j)Z_n(i\omega_j)e_k| \ll 1 \qquad (11)$$

also should be satisfied, recognizing the asymmetry of the matrix product $Z_d^{-1}Z_n$. This inequality (11) leads simply to

$$|\xi_{kj}/\xi_{jj}| \ll 1 \qquad (12)$$

(assuming $\xi_{jk} = \xi_{kj}$), which takes us back to where we started, i.e., to the point of having to evaluate directly the importance of the off-diagonal terms in Eq. (3).

In conclusion, it is believed that Dr. Flax is in error with his statement that the writer's results "are directly obtainable from the classical perturbation theory...given by Rayleigh." The present reply serves to illustrate the differences between Flax's criterion and the one presented originally.[1]

References

[1] Hasselman, T.K., "Modal Coupling in Lightly Damped Structures," *AIAA Journal*, Vol. 14, Nov. 1976, pp. 1627-1628.

[2] Hasselman, T.K., "Damping Synthesis from Substructure Tests," *AIAA Journal*, Vol. 14, Oct. 1976, pp. 1409-1418.

Errata

Dynamical Constraints in Satellite Photogrammetry

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[AIAA J. **15**, 488-498 (1977)]

THE second line after Eq. (5c) should read: centered principal body axes system, denoted by the mutually

Equation (6c) should read:

$$\omega_3(t) = \omega_3[t,t_0,I_1,I_2,I_3,\omega_1(t_0),\omega_2(t_0),\omega_3(t_0)]$$

Equations (7b) and (7c) should read, respectively:

$$\phi_2(t) = \sin^{-1}\left(\frac{I_3\omega_3(t)}{H}\right), \quad -\frac{\pi}{2} \le \phi_2 \le \frac{\pi}{2}$$

$$\phi_3(t) = \tan^{-1}\left(\frac{-I_2\omega_2(t)}{I_1\omega_1(t)}\right), \quad -\pi \le \phi_3 \le \pi$$

Equation (12) should read:

$$[C(\omega(t),\phi(t),\kappa(t))] = [\Phi(t,t_0)][C(\omega(t_0),\phi(t_0),\kappa(t_0))]$$

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Index category: Spacecraft Dynamics and Control.

The fourth line from the bottom of the second column on page 490 should read: in order to test the feasibility of incorporating full dynamic

The nineteenth line on page 491 should read: University of Virginia CDC 6400 computer. These programs are

The fourth line in Appendix A should read: *Assume*: Principal body axes $\{\hat{p}\}$ are ordered such that

The eighth line after Eq. (A4) should read: Eqs. (A1) to uncouple the equations of motion. Equations (A1)

Equation (A6c) should read:

$$\left(\frac{dx}{d\tau}\right)^2 = (1-x^2)(x^2-k^2)$$

The last line above Eq. (A9) should read: $s_i = +1, -1$, or 0, and

Equation (A10) should read:

$$|\omega_{3m}| = \left[\frac{2I_1T-H^2}{I_3(I_1-I_3)}\right]^{1/2}$$

Equation (A13b) should read:

$$= \left[\frac{(I_2-I_3)(2I_1T-H^2)}{I_1I_2I_3}\right]^{1/2} \text{ if } H^2 < 2I_2T$$

The sixth entry in the left-hand column of Table A1 should read: $\omega_3(t_0) \neq 0$

The eighth entry in the right-hand column of Table A1 should read: $s_3 = s_1 \, \text{sign}(\omega_2(t_0))$

The second line in the title of Appendix B should read: Angles Orienting Principal Body Axes to an Angular

The first line in the text of Appendix B should read: *Given:* The principal inertias of the body I_1, I_2, I_3, initial

The seventh line in Appendix B should read: Consider the body mass centered principal axes $\{\hat{p}\}$ and the

The equation immediately above Eq. (B8) should read:

$$[\tilde{\omega}]^T = \begin{bmatrix} 0 & \omega_3 & -\omega_2 \\ -\omega_3 & 0 & \omega_1 \\ \omega_2 & -\omega_1 & 0 \end{bmatrix}$$

Equation (B14) should read:

$$q = \text{Jacobi's nome} \equiv e^{-\pi K'/K}$$

Delete one of the right-hand brackets on the right-hand side of the second of Eqs. (B18).

The eleventh line in Appendix C should read: text below Eq. (12)].

Equation (C1b) should read:

$$\omega_1(t) = \omega_{1m} cn(\tau, \kappa) \quad \text{if } H^2 < 2I_2T$$

Equation (C1e) should read:

$$\omega_3(t) = \omega_{3m} dn(\tau, \kappa) \quad \text{if } H^2 < 2I_2T$$

The periods in Eq. (C3) and in the definition of $[C(\phi)]$ (four lines below Eq. (C4)) should be replaced by commas.

A right-hand bracket should be inserted at the end of Eq. (C7).

Equation (C12b) should read:

$$\frac{\partial C_{12}^T}{\partial \omega_3} = -\frac{I_3}{H^3} H_{b2} H_{b3}$$

The second term on the right-hand side of Eq. (C13) should read:

$$\frac{\partial [C(\phi)]}{\partial \phi_2(t)} \frac{\partial \phi_2(t)}{\partial \omega_i(t_0)}$$

The last right-hand parenthesis in the denominator of the first term on the right-hand side of Eq. (C16b) should be deleted.

Equation (C21) should read:

$$\frac{\partial \omega_{2m}}{\partial \omega_i(t_0)} = s_2 \left[\frac{I_1 \dfrac{\partial T}{\partial \omega_i(t_0)} - H \dfrac{\partial H}{\partial \omega_i(t_0)}}{[I_2(I_1 - I_2)(2I_1T - H^2)]^{1/2}} \right] \quad \text{if } H^2 \geq 2I_2T$$

$$= s_2 \left[\frac{H \dfrac{\partial H}{\partial \omega_i(t_0)} - I_3 \dfrac{\partial T}{\partial \omega_i(t_0)}}{[I_2(I_2 - I_3)(H^2 - 2I_3T)]^{1/2}} \right] \quad \text{if } H^2 < 2I_2T$$

Equation (C23) should read:

$$\frac{\partial T}{\partial \omega_i(t_0)} = I_i \omega_i(t_0)$$

The left-hand side of Eq. (C25) should read:

$$\frac{\partial cn\tau}{\partial \omega_i(t_0)}$$

The left-hand side of Eq. (C27) should read:

$$\frac{\partial \tau}{\partial \omega_i(t_0)}$$

The first term on the right-hand side of Eq. (C28a) should read:

$$\left[\frac{(I_2 - I_3)}{(I_1 - I_2)(2I_1T - H^2)(H^2 - 2I_3T)^3} \right]^{1/2}$$

The first term on the right-hand side of Eq. (C28b) should read:

$$\left[\frac{(I_1 - I_2)}{(I_2 - I_3)(H^2 - 2I_3T)(2I_1T - H^2)} \right]^{1/2}$$

The definition of $E(\theta, k)$ after Eq. (C33) should read:

$$E(\theta, k) \equiv \int_0^\theta \sqrt{1 - k^2 \sin^2 \alpha}\, d\alpha$$

After Eq. (C42) insert:

$$\text{where } E \equiv \int_0^{\pi/2} \sqrt{1 - k^2 \sin^2 \alpha}\, d\alpha$$

Equation (C56) should read:

$$\frac{\partial \gamma}{\partial \omega_i(t_0)} = 0 \quad \text{if } H^2 \geq 2I_2T$$

$$= \left[\frac{I_1 I_3}{(2I_1T - H^2)(H^2 - 2I_3T)} \right]^{1/2} \left[\frac{\partial T}{\partial \omega_i(t_0)} - \frac{2T}{H} \frac{\partial H}{\partial \omega_i(t_0)} \right],$$

if $H^2 < 2I_2T$

The second line in Ref. 5 should read: work Analysis Program," (FOTONAP), U.S. Army Engineers