Errata

A Universal Three-Angle Basis for Rotational Kinematic Analysis, Simulation and Control

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THE subject Note contains two errors. These have been brought to the authors attention by Carl Grubin[1] and Thomas R. Kane.[2] First, Eq. (2) should read

$$\text{vec}(A) = \sin\alpha\mathbf{x} \tag{2}$$

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Secondly, Eq. (10) is based on the assumption that the Euler axis of the rotation is in the body-fixed coordinate system. This is not true, hence, Eqs. (10–13) are incorrect. If the ω vector is parallel to a vector fixed in the body coordinate system, then the results presented are correct. This special case includes the constant body rate case. In this case, Eqs. (14–19) are correct and can be used for three-axis control, but not (in general) for the integration of the motion. The correct equations[3] for the derivative of the Euler axis disrection cosines are singular for rotations of multiples of 180° of total rotation angle.

References

[1] Grubin, C., private communication, Nov. 13, 1972, Hughes Aircraft Co., Culver City, Calif.
[2] Kane, T. R., private communication, Jan. 18, 1973, Stanford Univ., Stanford, Calif.
[3] Grubin, C., "Derivation of the Quaternion Scheme via the Euler Axis and Angle," *Journal of Spacecraft and Rockets*, Vol. 7, No. 10, Oct. 1970, pp. 1261–1263.