Fundamentals of Astrodynamics and Applications 5th Ed

Consolidated Errata

April 27, 2024

This listing is an on-going document of corrections and clarifications encountered in the book. I appreciate any comments and questions you find. I use RHS for "right hand side" when referring to equations and N/A for not applicable. You may reach me at: dvallado@comspoc.com or davallado@gmail.com. Changes in equations are sometimes indicated by circles. I have tried to indicate changes that were present in previous editions as I know many of you have those copies. For many corrections in the 2nd edition, the first and second printings had identical pages, unless otherwise noted with the first printing pages being in parentheses. The exact correction may differ, but it should get you close enough.

Page 180, Equation 3-40**:** (4th pg 178, 3rd pg 185, 2nd pg 183, 1st pg 64) The last term has an extra "0" and should be -0.053.

Page 226, Last sentence before Equation 3-85**:** (4th pg 225) Delete the "in "" as this could be confusing. The units here are in degrees, while code is usually in ".

Page 284, Figure 5-1**:** (4th pg 278) The ***K*** unit vector should be moved to the right.

Page 409, bottom paragraphs**:** (4th pg 405, 3rd pg 405, 2nd pg 387/389, 1st pg 359) The last line of the next to the last paragraph should be y_o instead of $\dot{y}_o$. The reference to Fig. 6-30 on the next to the last line should be for Fig. 6-29.

Page 792, Example 10-5**:** (4th pg 776, 3rd pg 770, 2nd pg 720/718, 1st pg 707)The final matrix should be

$$\hat{\boldsymbol{P}} = \begin{bmatrix} 3.4693\times10^{-2} & -2.1039\times10^{-3} & 1.7599\times10^{-3} & -2.1218\times10^{-4} & 1.0066\times10^{-5} & -4.4413\times10^{-5} \\ -2.1039\times10^{-3} & 1.6328\times10^{-2} & -2.4527\times10^{-2} & 3.7660\times10^{-5} & -1.0357\times10^{-4} & 1.1741\times10^{-4} \\ 1.7599\times10^{-3} & -2.4527\times10^{-2} & 4.5064\times10^{-2} & -4.0106\times10^{-5} & 1.4877\times10^{-4} & -2.4411\times10^{-4} \\ -2.1218\times10^{-4} & 3.7660\times10^{-5} & -4.0106\times10^{-5} & 1.7027\times10^{-6} & -3.6136\times10^{-7} & 3.9404\times10^{-7} \\ 1.0066\times10^{-5} & -1.0357\times10^{-4} & 1.4877\times10^{-4} & -3.6136\times10^{-7} & 7.5809\times10^{-7} & -7.3725\times10^{-7} \\ -4.4413\times10^{-5} & 1.1742\times10^{-4} & -2.4411\times10^{-4} & 3.9404\times10^{-7} & -7.3726\times10^{-7} & 1.9328\times10^{-6} \end{bmatrix}$$

and the text should have new values: "Notice the similarity to the answer from Example 10-4. The eigenvalue standard deviation (1σ) has improved and is now about 186 m, r_J is 128 m and r_K is 212 m, for a total of about 310 m. Note the improvement by processing just a few more observations. If we had processed an additional 18 observations, the eigenvalue uncertainty would have been about 224 m.".

Page 930-931, Alg 75 and 3rd paragraph from the bottom**:** (4th pg 913, 3rd pg 901, 2nd pg 833) The references for ς should be for ECI, not ECEF. It should read "site vector in ECI" and not reference ECEF.

Page 952, Equation 11-60**:** The Mahalanobis distance should be squared and the covariance term in the middle should be "+".

Page 1046, Equation C-38**:** The equation for *m* should be the change in *y* over the change in *x*.

Page 1064, Pluto Equations**:** (4th pg 1048, 3rd pg 997, 2nd pg 915) The equation for *a* and *e* should not have " units. Inclination should have a "+" before 11.07.