



Correction: Low-Thrust Collision Avoidance Maneuver Optimization

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Correction Notice

This correction pertains to typos in some of the showcased equations without affecting the validity of the presented results and considerations, in the original article when it was first published online [<https://doi.org/10.2514/1.G006630>].

Corrections involve:

- Equations (35) and (36) on page 1818:

$$\lambda_{r0} = 2v\mathbf{B}^{-1}\mathbf{R}_{2D}^T\mathbf{C}^{-1}\mathbf{R}_{2D}[-(\mathbb{I} - 2v\mathbf{DB}^{-1}\mathbf{R}_{2D}^T\mathbf{C}^{-1}\mathbf{R}_{2D})^{-1}(\mathbf{r}_p - \mathbf{r}_s) - \mathbf{r}_s] \quad (35)$$

$$\lambda_{v0} = -2v\Phi_{44}^{-1}\Phi_{43}\mathbf{B}^{-1}\mathbf{R}_{2D}^T\mathbf{C}^{-1}\mathbf{R}_{2D}[-(\mathbb{I} - 2v\mathbf{DB}^{-1}\mathbf{R}_{2D}^T\mathbf{C}^{-1}\mathbf{R}_{2D})^{-1}(\mathbf{r}_p - \mathbf{r}_s) - \mathbf{r}_s] \quad (36)$$

Are rewritten as

$$\lambda_{r0} = \mathbf{D}^{-1}[(\mathbb{I} - 2v\mathbf{DB}^{-1}\mathbf{R}_{2D}^T\mathbf{C}^{-1}\mathbf{R}_{2D})^{-1}(-2v\mathbf{DB}^{-1}\mathbf{R}_{2D}^T\mathbf{C}^{-1}\mathbf{R}_{2D}\mathbf{r}_s + \mathbf{r}_p) - \mathbf{r}_p] \quad (35)$$

$$\lambda_{v0} = -\Phi_{44}^{-1}\Phi_{43}\lambda_{r0} \quad (36)$$

- Equations (41) and (42) on page 1819

$$\lambda_{r0} = 2v\mathbf{B}^{-1}\mathbf{R}_{2D}^T\mathbf{R}_{2D}[-(\mathbb{I} - 2v\mathbf{DB}^{-1}\mathbf{R}_{2D}^T\mathbf{R}_{2D})^{-1}(\mathbf{r}_p - \mathbf{r}_s) - \mathbf{r}_s] \quad (41)$$

$$\lambda_{v0} = -2v\Phi_{44}^{-1}\Phi_{43}\mathbf{B}^{-1}\mathbf{R}_{2D}^T\mathbf{R}_{2D}[-(\mathbb{I} - 2v\mathbf{DB}^{-1}\mathbf{R}_{2D}^T\mathbf{R}_{2D})^{-1}(\mathbf{r}_p - \mathbf{r}_s) - \mathbf{r}_s] \quad (42)$$

Transform into:

$$\lambda_{r0} = \mathbf{D}^{-1}[(\mathbb{I} - 2v\mathbf{DB}^{-1}\mathbf{R}_{2D}^T\mathbf{R}_{2D})^{-1}(-2v\mathbf{DB}^{-1}\mathbf{R}_{2D}^T\mathbf{R}_{2D}\mathbf{r}_s + \mathbf{r}_p) - \mathbf{r}_p] \quad (41)$$

$$\lambda_{v0} = -\Phi_{44}^{-1}\Phi_{43}\lambda_{r0} \quad (42)$$

- Eq (64) on page 1820.

$$\mathbf{A} = \begin{bmatrix} \mathbf{0}_{3 \times 3} & \mathbb{I}_{3 \times 3} & \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} \\ \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & \mathbf{A}_{24} \\ \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} \\ \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & -\mathbb{I}_{3 \times 3} & \mathbf{0}_{3 \times 3} \end{bmatrix},$$

$$\text{with } \mathbf{A}_{24} = -a_{\max} \begin{bmatrix} \mathbf{v} \\ \mathbf{v} \end{bmatrix}^T$$

The Matrix A should be refined as follows:

$$A = \begin{bmatrix} \mathbf{0}_{3 \times 3} & \mathbb{I}_{3 \times 3} & \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} \\ -A_{34} & \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & A_{24} \\ \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & A_{34} \\ \mathbf{0}_{3 \times 3} & \mathbf{0}_{3 \times 3} & -\mathbb{I}_{3 \times 3} & \mathbf{0}_{3 \times 3} \end{bmatrix}, \quad \text{with } A_{24} = -a_{\max} \left[\frac{\mathbf{v}}{v} \left(\frac{\mathbf{v}}{v} \right)^\top \right] \quad \text{and} \quad A_{34} = \frac{\mu}{r^3} \mathbb{I}_{3 \times 3} - 3 \frac{\mu}{r^5} \overbrace{\begin{bmatrix} r_x \mathbf{r} & r_y \mathbf{r} & r_z \mathbf{r} \end{bmatrix}}^{3 \times 3 \text{ matrix}} \quad (64)$$

4. Eq. (74) on page 1825

$$a_c = -\frac{1}{2} (\lambda_v \geq \lambda_{th}) a_{\max} v \lambda v \quad (74)$$

Becomes:

$$a_c = -(\lambda_v \geq \lambda_{th}) a_{\max} \frac{\lambda_v}{\lambda_v} \quad (74)$$