JET PROPULSION LABORATORY

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TITLE: An Alternative Method for the Determination of Elliptic and Hyperbolic Trajectories

DISTRIBUTION: Section 312 Engineers, J. F. Scott, W. Scholey

(i) Replace formula (7) on page 3 by

$$\frac{d^2f}{da^2} = \frac{3}{4}\frac{f(a)}{a^2} + \frac{1}{\sqrt{a^3\mu}}\left\{(s-c)\sqrt{\frac{1-x_2}{1+x_2}} - s\sqrt{\frac{1-x_1}{1+x_1}} + \frac{s}{\sqrt{1-x_1^2}}\cdot\frac{1-x_1}{1+x_1} - \frac{s-c}{\sqrt{1-x_2^2}}\cdot\frac{1-x_2}{1+x_2}\right\}$$

(ii) Replace the interval $\frac{1}{2}(r_1 + r_2) \leqq a \leqq r_1 + r_2$ and corresponding proof on pages 3 and 4 by the interval $s-c \leqq a \leqq s$ and the following argument:

Since $x_1 = 1 - \frac{s}{a}$ and $s-c \leqq a \leqq s$

$$\frac{1}{1+x_1} \geqq 1$$

$$\therefore \quad \frac{\sqrt{1-x_1}}{1+x_1} \geqq \sqrt{1-x_1}$$

$$\therefore \quad \frac{1-x_1}{1+x_1}\cdot\frac{1}{\sqrt{1-x_1}}\cdot\frac{1}{\sqrt{1+x_1}} \geqq \frac{\sqrt{1-x_1}}{\sqrt{1+x_1}}$$

$$\therefore \quad \frac{s}{\sqrt{1-x_1^2}}\cdot\frac{1-x_1}{1+x_1} \geqq s\sqrt{\frac{1-x_1}{1+x_1}}$$

Since $x_2 = 1 - \frac{s-c}{a}$, $s-c \leqq a \leqq s$ implies

$$1 \geqq \frac{1}{1+x_2}$$

$$\therefore \quad \frac{\sqrt{1-x_2}}{\sqrt{1+x_2}} \geqq \frac{1-x_2}{\sqrt{1-x_2}} \frac{1}{\sqrt{1+x_2}} \cdot \frac{1}{1+x_2}$$

$$\therefore \quad (s-c) \sqrt{\frac{1-x_2}{1+x_2}} \geqq \frac{s-c}{\sqrt{1-x_2^2}} \frac{1-x_2}{1+x_2}$$

hence in view of (7) the lower half of C is convex from below in $s-c \leqq a \leqq s$

(iii) Replace F_1^* and F_o^* appearing below $\overline{PQ}$ on page 11 by $\widetilde{F}_1^*$ and $\widetilde{F}_o^*$ respectively.

(iv) Replace $\widetilde{F}_o^*$ on page 12 line 3 by F_o^*.

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