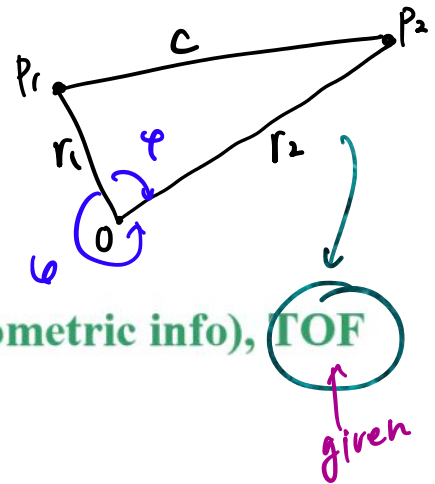


# Lambert Algorithm

Monday, November 23, 2020 01:31 PM

# Lambert Algorithm



**Given:**  $r_1, r_2$ , space triangle (geometric info), **TOF**  
**Find:** transfer arc

1. Distinguish angular separation between  $r_1$  and  $r_2$   
 Identify transfer angle as  $< 180^\circ$  or  $> 180^\circ$

→ Specify type 1 or type 2

current velocity  
direction  
for  $P_1$

2. Calculate  $\text{TOF}_{\text{par}}$ ; compare  $\text{TOF}_{\text{desired}}$  with  $\text{TOF}_{\text{par}}$

$$\text{TOF} < \text{TOF}_{\text{par}}$$



required transfer hyp

$$\text{TOF} > \text{TOF}_{\text{par}}$$



required transfer ellipse

from space  
triangle

Iterative solve for  $a$  or  $|a|$

3. Guess ' $a$ ':

$$a = a_{\min}$$

smallest  $a$  for elliptical arcs

$$a = 0$$

smallest  $a$  for hyperbolic arcs

4. Calculate  $\alpha_o, \beta_o$  or  $\alpha'_o, \beta'_o$

[4a. Decide on transfer type if not already known: A or B]

5. Iterate on ' $a$ ' → determine correct " $a$ "

6. →  $p, e, \dots$

↑  
analytical  $p = p(q, \beta)$

↑  
 $q, \beta$ , correct  $a$

solve  
Lambert's  
Eqn.