- **Homework 5**

Determine the minimum-time continuous-thrust transfer from an initial orbit of radius 7000 Km to a final orbit of radius 42164 Km (GEO)

(using the canonical units DU and TU in integrations)

with the following propulsion parameters

$c = 20 \frac{Km}{sec}$ and $u_T^{(max)} = 0.05\, g_0$

Local search on $\{\lambda_{10}, \lambda_{30}, \lambda_{40}, t_f\}$ can be performed, for instance using fmincon in Matlab, starting from the following guess values

$$\lambda_{10}^{(G)} = -1$$
$$\lambda_{30}^{(G)} = 0.2$$
$$\lambda_{40}^{(G)} = -1$$
$$t_f^{(G)} = 10 \quad (TU)$$

Plot the time histories of

(i) radius

(ii) velocity components v_n, v_t

(iii) thrust pointing angle

(iv) transfer trajectory