

# Optimization of High-Inclination Orbits Using Planetary Flybys for a Zodiacal Light Imaging Mission





### Finding Maximum Orbital Height

Results - Earth  $\Delta \mathbf{v} = \mathbf{57.12} \text{ m/s}$ -Venus Europa Orbiter z = 0.32 AU ZODI Before Flyby ZODI During Flyby -ZODI After Flyby (AU) (N -0.1 N -0.2 --0.3 -0.5 -0.5 Y (AU) () 0.1 -N 0 --0.1 --0.5 -1.5 X (AU)

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## Initial Value Problem – **Orbit Propagation to find** max orbital height subject to $t \ge t_X$ , $\mathbf{s}(t_X) = \mathbf{s}_X$

State of ZODI at any point of its resultant orbit  $\mathbf{s}(t) = [x \ y \ z \ v_x \ v_y \ v_z]^T$ 

Inputs  $\mathbf{u} = [t_D \ t_E \ \eta \ \zeta]^T$ 

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