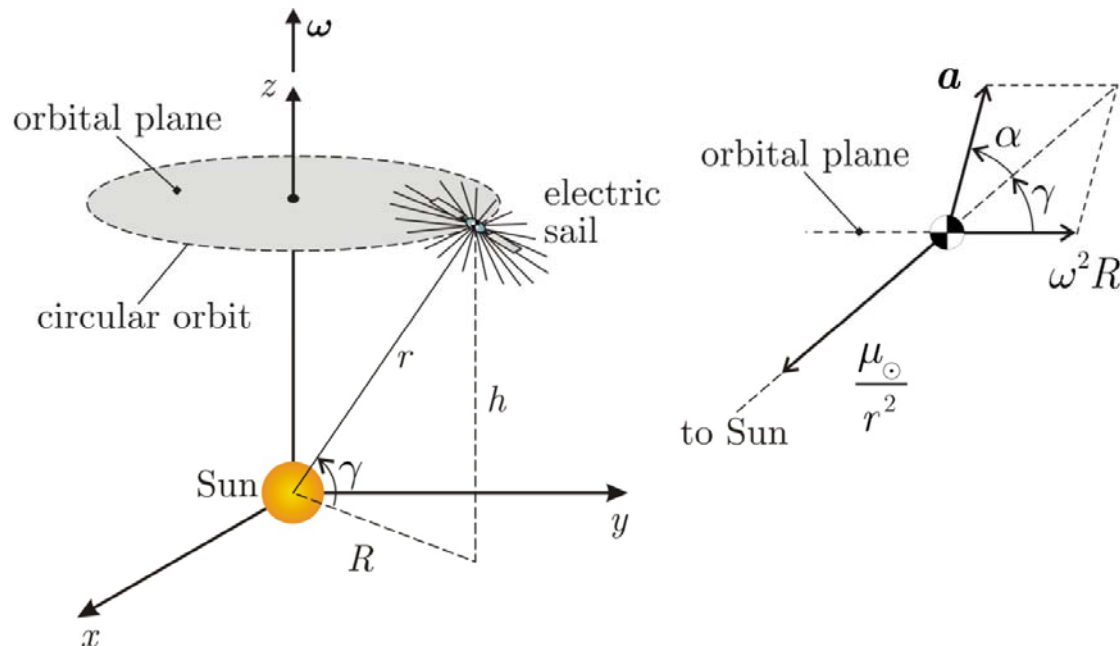


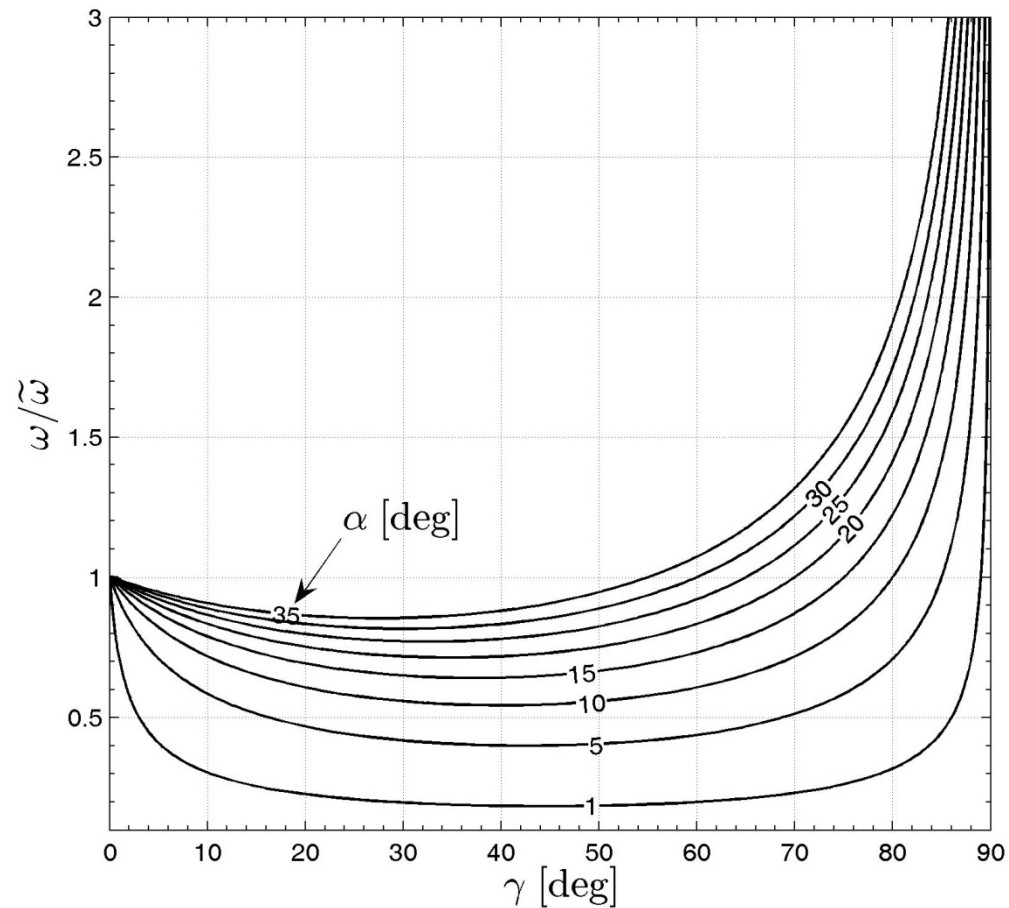
Non Keplerian Orbits

- An electric sail may be used for the observation of sun's polar regions by inserting the spacecraft in a circular, non-Keplerian orbit (NKO), whose plane does not pass for the sun center of mass.
- A NKO can be maintained by suitably orienting the thrust direction in such a way to balance the centrifugal component of spacecraft acceleration.



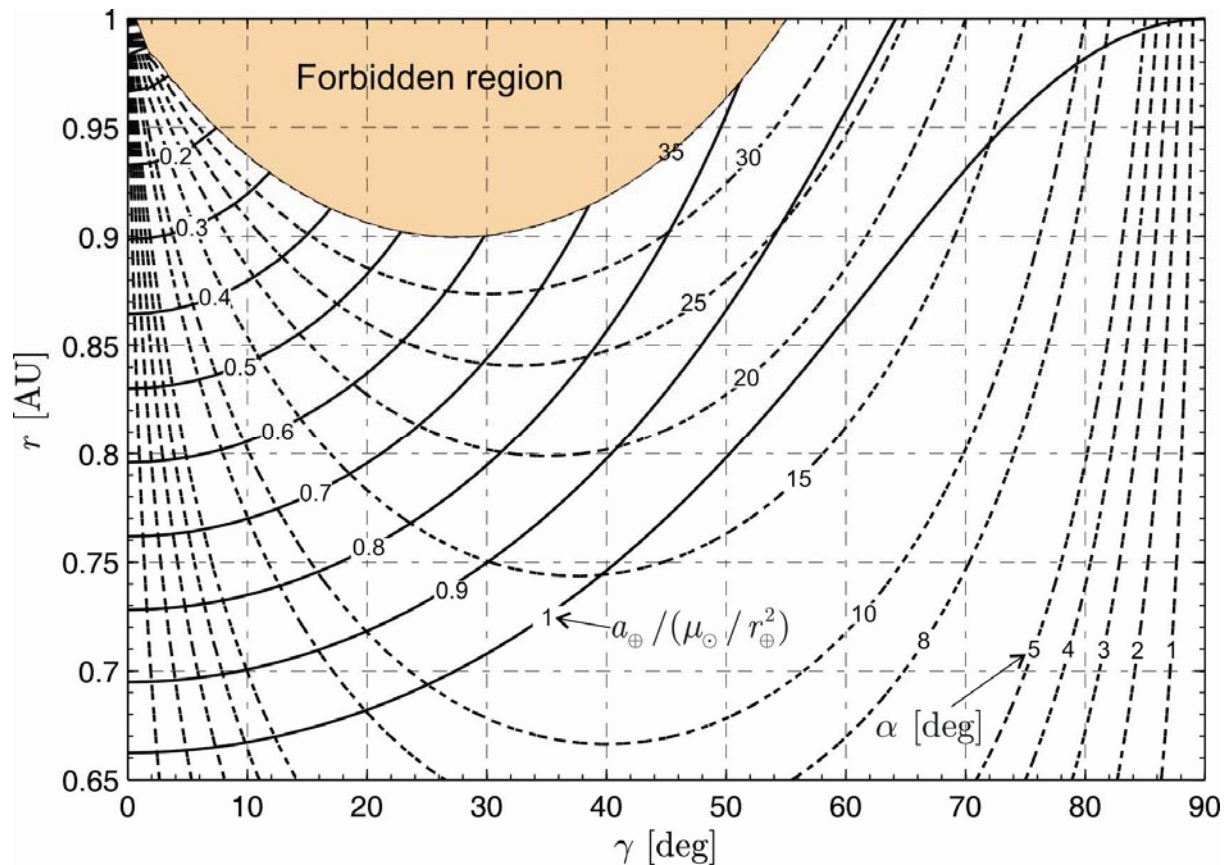
Electric sail cone angle as a function of the visual angle and angular velocity

- $\tilde{\omega} = \sqrt{m_{\oplus} / r^3}$ is the angular velocity of a Keplerian orbit



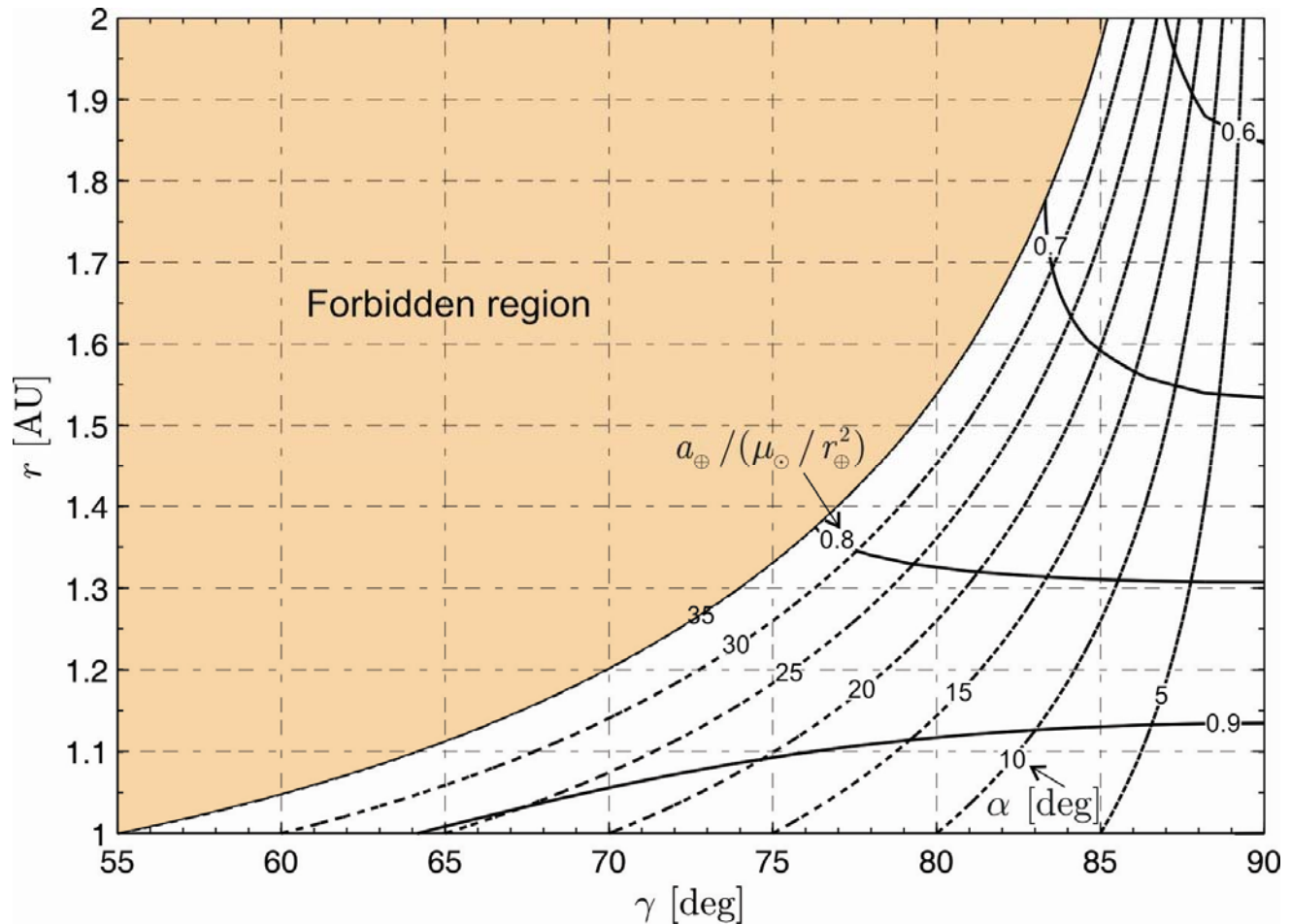
Electric sail performance for NKO with T=1 year

- a_A is the propulsive acceleration at 1 AU

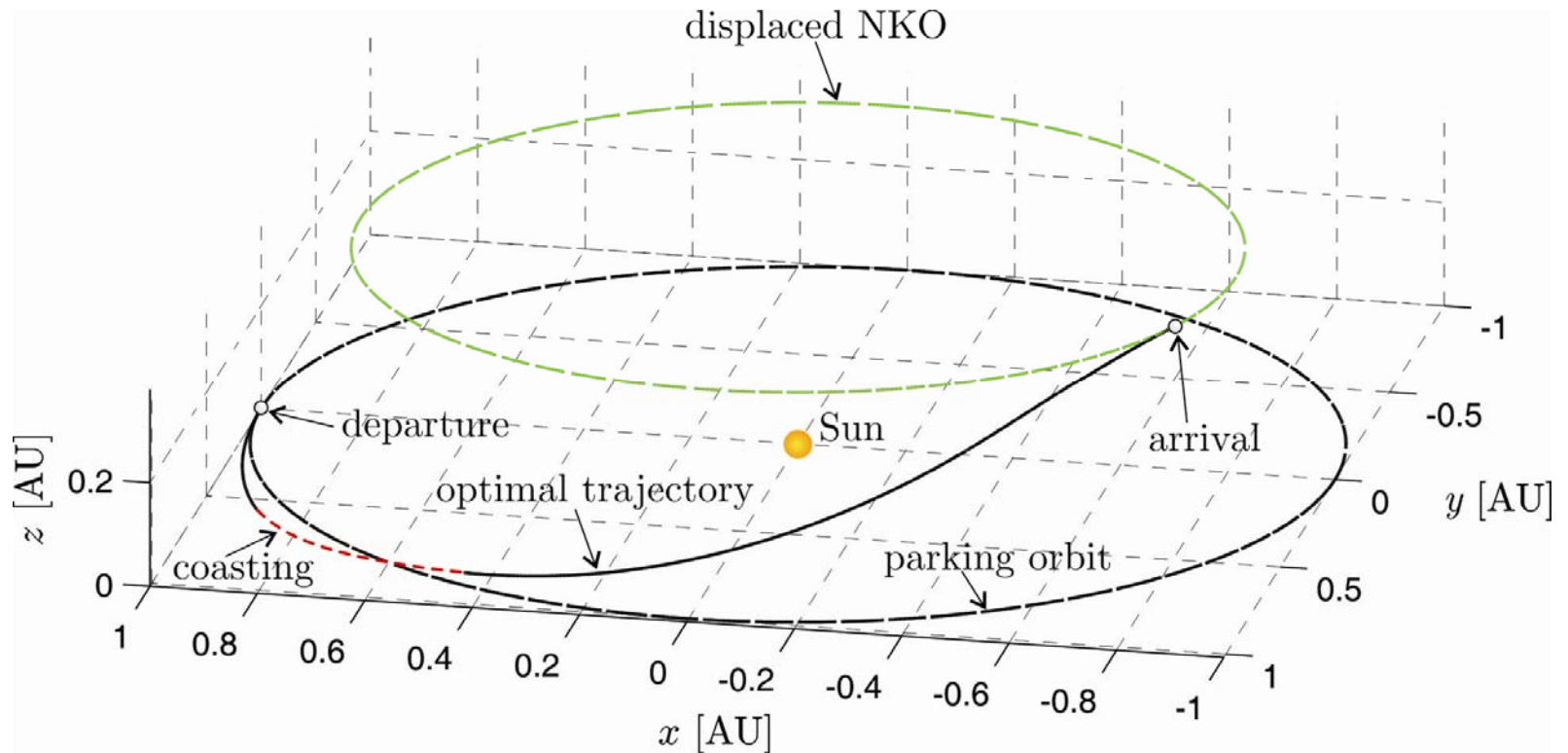


Electric sail performance for NKO with T=1 year

- a_A is the propulsive acceleration at 1 AU



Example of optimal transfer towards a NKO with $T=1$ year, $r=0.9$ AU, visual angle = 25 deg



Comparison electric sail vs. solar sail

