# DeltaV1 and DeltaV2:

## Variables to know:

d\_E: the distance Earth-Sun (at the start of the Transfer orbit ?)

d\_S: the distance Saturn-Sun (at the end of the Transfer orbit ?)

p\_E: the period of Earth’s orbit

p\_S: the period of Saturn’s orbit

G: the gravitational constant

M: the mass of the central body

## Variables that are derived from the known variables

a: semi-major axis of the Transfer orbit

p\_h: the period of the Transfer orbit

v\_E: the velocity on earth’s orbit

v\_S: the velocity on Saturn’s orbit

v\_p: the velocity at periapsis of the Transfer orbit

Deltav\_1: the velocity that needs to be applied to enter the Transfer orbit

v\_a: the velocity at apoapsis of the Transfer orbit

Deltav\_2: the velocity that needs to be applied to exit the Transfer orbit

Time of the Transfer:

Time of the Transfer:

From (3), if we have two points of the trajectory and we know the time interval between the two, we can compute the semi-major axis.