

Sheet1

Tidal Semi-major Axis Decay Rate			
Given by standard equation (e.g., Kaula 1964)			
Useful for small moons on low eccentricity and inclination orbits			
Variable	Units (MKS)	Description	Phobos
G	$m^3 kg^{-1} s^{-2}$	Universal Gravitational Constant	6.672E-11
a	m	Semi-major axis of the moon	9377200
m	kg	Mass of moon	1.08E+16
M0	kg	Mass of planet	6.418E+23
R	m	Radius of planet	3394000
k2	(unitless)	Tidal Love number, degree 2	0.16
Q	(unitless)	Tidal dissipation parameter	157
I	degrees	Inclination in degrees	1
Calculated			
da/dt	m/s	Semi-major axis decay rate	-0.000000001
da/dt	m/yr	Semi-major axis decay rate	-0.021550342
timescale	yr	Rough Semi-major axis decay timescale, defin	-435129979.7
dI/dt	deg/s	Inclination decay rate	-3.64104E-17
dI/dt	deg/yr	Inclination decay rate	-0.000000001
timescale	yr	Rough inclination decay timescale, defined as	-870304084.4

Deimos	Triton
6.672E-11	6.672E-11
23463200	354760000
1.8E+15	2.15E+22
6.418E+23	1.02E+26
3394000	25225000
0.16	0.3
157	100000
1	156
-7.33621E-13	-1.51001E-11
-0.000023151	-0.000476521
-1.01347E+12	-7.44479E+11
-1.56326E-20	-4.97858E-19
-4.93329E-13	-1.57112E-11
-2.02705E+12	-9.92922E+12