2. $SC_1 \cdot 4\pi r_1^2 = SC_2 \cdot 4\pi r_2^2$ $\quad r_1 = 1AU \quad r_2 = 5AU$

$SC_2 = \frac{1}{25} SC_1$

$SC_2 \cdot A = \sigma A T^4$ $\quad \Rightarrow \quad T \approx 176.316K$

3. $SC \cdot A = \sigma A T^4$

$SC = \frac{E}{4\pi R^2}$ $\quad \Rightarrow \quad T = \left(\frac{E}{4\pi\sigma}\right)^{1/4} \cdot R^{-1/2}$

$T = KR^{-1/2}$ $\quad T = 260K \quad R = 1AU \quad K = 260K \cdot AU^{-2}$

$1250K = KR^{-1/2}$ $\quad R' \approx 0.043AU$

4. $\frac{17.3Hz}{1420MHz} = \frac{2v}{c}$ $\quad \Rightarrow v = 1.827m/s$

$T = \frac{\pi D}{v} \approx 20813266\ s \approx 240.89\ d$

补充

1、 $\frac{GMm}{R^2} = \frac{4\pi^2 mR}{T^2} \Rightarrow R \approx 98675\,km$

Cassini Division 及其之外的土星环在同步轨道外侧

2、 $P = \frac{R_E^3}{r^3} \approx 9.5777 \times 10^{-9} = 0.000000095777\%$

$< 0.00000846\%$

3、 $t \approx \frac{10^{-3} MG}{5 \times 10^5 kg} = 1.193 \times 10^{16}\,d$