

Exercise 2.1 - Solar Wind

v.02

Problem Statement

Numerical data

Mass of the sun [kg]:

$$In[*]:= M_S = 1.99 \times 10^{30};$$

Mass flux of particles [Sun mass/year]:

$$In[*]:= F_m = 1.6 \times 10^{-14};$$

Earth-Sun distance [km]:

$$In[*]:= L = 150\,000\,000;$$

Speed of the particles [m/s]:

$$In[*]:= v = 450 \times 10^3;$$

Type of particles: H₂ : 95%, He : 4%, O₂ : 1%

Earth radius [km]:

$$In[*]:= R_{earth} = 6360;$$

Questions

- Evaluate the total mass of particles arriving on Earth every day.
- Evaluate the number of solar wind particles impacting a $5 \times 2 \text{ m}^2$ solar array every day.

Hint

The solar wind is composed of ionised particles.