Answer on Question 55050, Physics / Astronomy | Astrophysics

Question:

Given the TM from above, what is the flux density of Mars at closest approach to Earth at an observing frequency of 15 GHz.

Solution:

Flux density of Mars at closest approach:

$$1'' = 4.84 \times 10^{6}\, rad$$

$$S_m = B_v \Omega = \frac{2kTv^2}{c^2} \times \frac{\pi(18 \times 4.84 \times 10^{-6})^2}{4} = 9.3 \times 10^{-26} \frac{W}{m^2 \times Hz} = 9.3 Jy$$

Answer: Sm = 9.3 Jy