

Solar Physics, Exercise 2

1 February 2017 at 14-16 in D116
Submit by 31 January 2017 12:00

1. Show that the Eddington approximation predicts a limb-darkening function of the form

$$\frac{I(0, \mu)}{I(0, 1)} = \frac{2 + 3\mu}{5}.$$

2. Derive the relations (3.15) and (3.16) between the Einstein coefficients A_{UL} , B_{UL} and B_{LU} .
3. Explore the Sun using Extreme UltraViolet (EUV) observations by Atmospheric Imaging Assembly (AIA) instrument of Solar Dynamics Observatory during the week 3 of 2017 (16.01.2017 - 23.01.2017). Which channels of the AIA instrument correspond to higher/lower temperatures and higher/lower layers above the photosphere? In which channels the Sun appears to be more/less dynamic? To which temperatures and heights does it correspond? Why these wavelengths for AIA channels were chosen? Explore the active regions emerging in different channels during the week. How do they develop? Explore composite 3-wavelength images.

Links:

<https://sdo.gsfc.nasa.gov/data/aiahmi/>

<https://helioviewer.org/>