

**Applications with the Newest Multi-spectral Environmental
Remote Sensing Satellites**

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Homework Assignment 1 (Due 10 June 2006)

Read Chapters 2 and 3 of “Remote Sensing Applications with Meteorological Satellites”

Solve the following problems

1. Using Planck's radiation law, determine the temperature of the blackbody where $B(\nu, T)$ versus ν peaks at 500 cm^{-1} .
2. What is the ratio of blackbody radiances at $B(10 \text{ } \mu\text{m}, 300 \text{ K})$ and $B(0.5 \text{ } \mu\text{m}, 6000 \text{ K})$? Estimate this without calculating the radiances explicitly.
3. If the 4 micron brightness temperature is 310 K and the 11 micron brightness temperature is 290 K, what fraction of the radiance at 4 microns is due to reflected solar radiation? Use $B(4 \text{ } \mu\text{m}, T)$ proportional to T^x where $x \sim 12$.