

Homework No.4 for Extreme Value Statistics

Deadline: April 7th, 12AM.

(1) 50 pt.

There is a room of volume $10m^3$ whose walls are kept at temperature $300^\circ K$. The room is filled with air at 1 atm pressure.

(i) Consider the photons and the particles in the room and determine the average of the largest energies of the photons and of the particles. Which one is larger?

(ii) Estimate the average difference between the largest and second largest energies of both the particles and the photons.

(2) 50 pt.

Calculate the 1st Tremain-Richstone ratio T_1 for $-\infty < \gamma \leq 1/2$ (note that the second moments of the limit distribution will have to be calculated and it does not exist for $\gamma \geq 1/2$). Show that $T_1(\gamma) > 1$ in the allowed range of γ s.