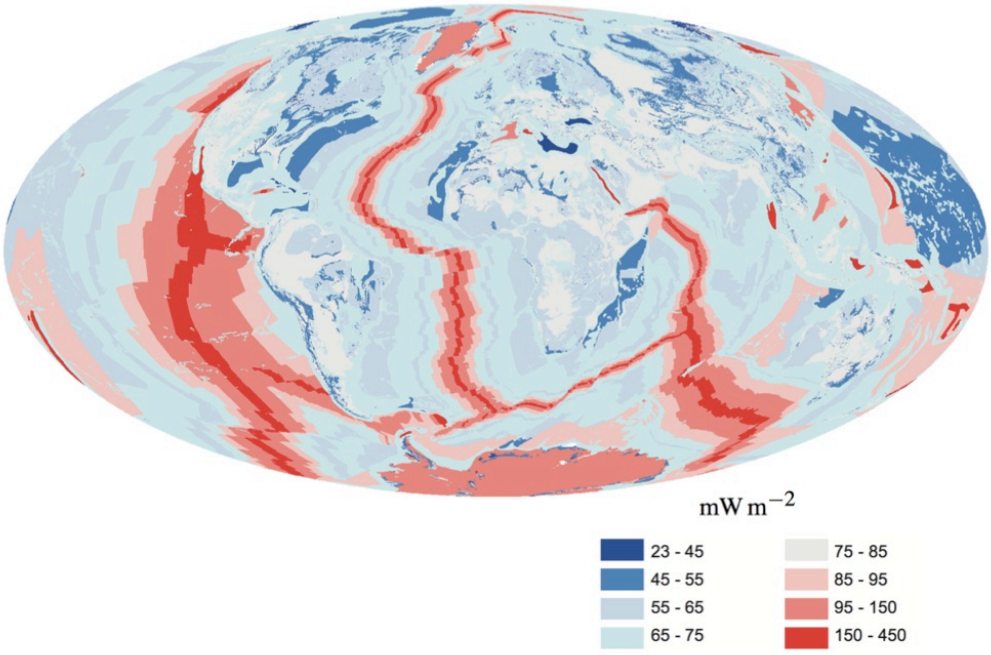
AST 300B – Spring 2017
In-class Problem Due: Monday January 23

3. Assume that the Sun radiates isotropically.

   (a) Calculate the total specific intensity and the flux emerging from the surface of the Sun? Quote your answer in both mks and cgs units.

   (b) Radiogenic heating from the radioactive decay of isotopes in the mantle and crust (predominantly ^{238}U, ^{232}Th, ^{40}K, and ^{235}U) and primordial heat left over from the formation of the Earth result in approximately 47 terawatts of heat flowing from the interior of the Earth to the surface today. This heat drives plate tectonics and geological processes. How does the geothermal flux coming from the interior of the Earth compare to the flux of radiation from the Sun (quote as a percentage)? What sets the temperature of the surface of the Earth – heat from the interior or heat from the Sun?



An "internal heat" map of the Earth.