Geophysics 150: Home set due Nov. 29, 2000

1. Turkey or something else large will be cooked on Thanksgiving. The cookbook or wrapper of the turkey will give cooking times. Usually in minutes per pound for a range of pounds. If you get a NAFTA turkey it may also have kilograms.   Plot the total cooking times as a function of weight. Get a cookbook if you are not cooking anything large.

2. Assume a spherical turkey. The cooking time should scale as $t = r^2 / \kappa$. Find the weight versus time relationship and compare it with the empirical one on the graph.

3. The heat capacity of turkey is about 4×10^6 J/m^3 ^{o}C. The conductivity is about that of water 0.8 W/m ^{o}C. Do the values of the cooking times make much sense? You can measure turkey if you wish or assume that its density is about that of water.

4. The latent heat of ice and turkey is about 320×10^6 J/m^3. Compare the frozen versus thawed cooking times. Cooked turkey is 80°C in the center. Explain the logic of the times given in the book or wrapper if frozen times are given.