ATMS 564 PS 2
Problems: 9.1, 9.3(a&c) using Matlab, 9.5, and the following work with AIM.

Point your browser to:
http://www.hpc1.uea.ac.uk/~e770/aim/model3/mod3rhw.htm

You should see that this is the page for "Model III" for the Aerosol Inorganics Model

To begin, choose the "Graph" output option.

The goal is to study how adding additional components to an aerosol system alters the DRH of the individual components, liquid water content of the particle in general, and solution composition.

1. Study the composition of a system that has 1 mole (per m^3 of air) of Na^+ and 1 mole of Cl^- (think sea salt) as a function of RH, from 0.3 to 0.9 RH. Do not suppress any solid formation and do not suppress partitioning of gases. After clicking "Run":

- Examine the graph of moles of H_2O(l) vs RH to determine the DRH of this system by using the drop-down menus for each axis.
- What is the molality (moles per kg $H_2O_{(l)}$) of Na^+ (or Cl^-) at the DRH? How does this compare to the solubility data in Table 9.2 of Seinfeld and Pandis?

2. Now add 0.1 moles of NH_4^+ and NO_3^- to the system and repeat the calculations
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- Examine moles of $H_2O_{(l)}$ vs RH. How is it different?
- Examine moles of NaCl(s) vs RH to determine its DRH. How is it different that the previous run?
- What solids form and below which RH do they exist? The DRH of pure NH_4NO_3 is 61%. How does that compare to the RH at which NH_4NO_3(s) = 0 in this system?

3. Repeat the calculation for 0.5 moles of NH_4^+ and NO_3^-.

- Why does the number of moles of NaCl(s) increase at 0.55RH before it begins to deliquesce?