



Homework Assignments

www.cv.nrao.edu/php/aremijan/splat_beta

1. Using the mass calculator, find the molecular mass of the well known interstellar molecules like CO, NH₃, CH₃OH, CH₃OCHO and CH₃CH₂CN.
2. Having the mass of CO, select that molecule from the list and find all the available transitions, (ie. All frequencies) of CO in the known catalogs.
3. Find the NRAO recommended frequencies for CO
4. Find and display the transitions of CO with an upper state energy greater than 50 K
5. Find and display the transitions of CO with line strengths greater than 0.2 D². (NOTE: make sure you turn off 4) first!)
6. Find and display the transitions of CO with an upper state energy less than 30 cm⁻¹ AND line strengths greater than 0.001 D².
7. Export the results in 6) in a tab delimited .csv file.
8. Go back to the search defaults. You can just reload the Splatatalogue homepage.
9. Select "all" molecules and under the search options, "uncheck" the atmospheric, potential and probable molecule boxes. Search for all transitions between 201 and 202 GHz. How many transitions are there between those frequencies?
 1. "check" the atmospheric box – redo the search. How many transitions are there now?
 2. "check" the atmospheric and potential boxes – redo the search. How many transitions are there now?
 3. "check" the atmospheric, potential and probable boxes – redo the search. How many transitions are there now?
10. Find the NRAO recommended frequencies in that frequency range.
11. Find and display the transitions that may be populated in a hot molecular cloud core of 200 K.
12. Display the line strength of all the transitions in S_{ij}m² instead of the the default values.
13. Export the results in 12) in an ampersand delimited .csv file.
14. Play with all the other search options as well as modeling a synthetic spectrum.