PRESENTATION

2nd June 2016

CHAPTERS

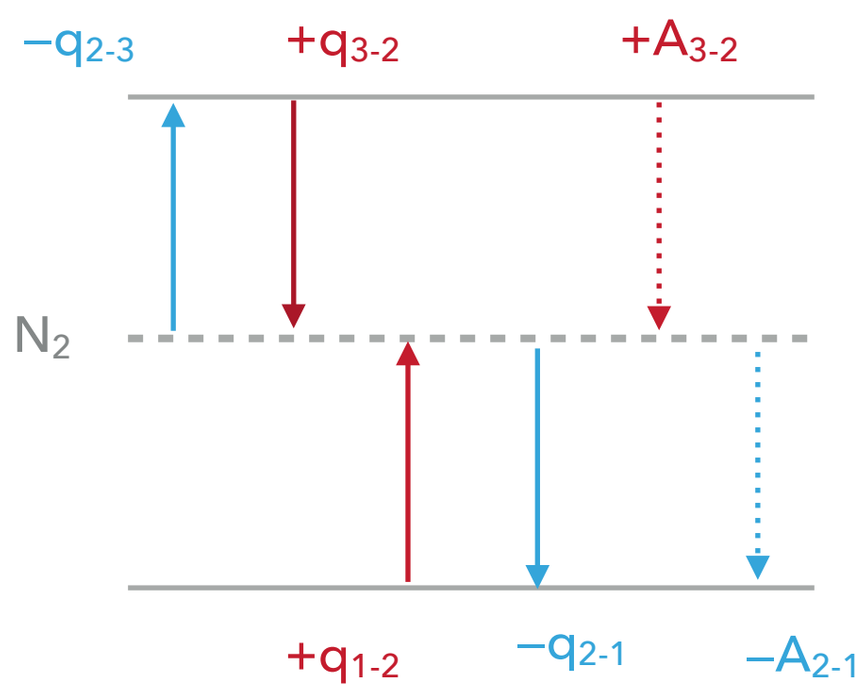
- Introduction
- Structure packages for the target description
- R-matrix Theory
- Collisional models
- Sulphur
- Argon
- Cobalt
- Conclusions

CHAPTER 3: R-MATRIX

- Look at two particular processes of electron-impact excitation and photoionization
- Define the general R-matrix method for a non-relativistic case
- Outline some of the extensions required to include the Breit-Pauli Hamiltonian and Dirac Hamiltonian
- A summary of the computer codes currently being implemented

CHAPTER 4: COLLISIONAL MODELS

- Would like to model specific plasma conditions with the atomic data we generate within the department
- A working code that can produce quick results



- Recombination rates subroutine complete + implemented

CHAPTER 5: S X

- An extension of work that was originally considered by Bell & Ramsbottom (2000)
- Really good agreement with the results from OPEN-ADAS (only comparison)
- Able to successfully run the QB serial code for identifying major resonance series
- Adapted the code to read H.DAT files from DARC and fixed any bugs

CHAPTER 6: AR III

- Two separate experiments were carried out. The valence shell photoionization at ALS, USA, and the L-shell process in SOLEIL, France
- We carried out a BP + DARC calculation with good agreement at the valence shell energy region
- Only compared the DARC at the L-shell region (didn't consider this at the time of running BP)

CHAPTER 7: CO III

- Looked at the photoionization for the first time and compared results with Storey and Sochi (2016) for the electron-impact excitation
- Good agreement with approximations
- Able to run and test the code mentioned in Chapter 4 and look at specific line ratios mentioned by the community
- We are now in the process of a collaboration with ARC here at Queens with these results

CHAPTER 8: NI II

- Calculation is underway, and the analysis stage should start soon
- Promising results from such a difficult system. Difficult to find much agreement between the various R-matrix codes
- This data will also be extremely useful at ARC in a different project
- Look at the recombination rates for this particular case