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Professor Dagmar Zadrapova  
Office of Student Affairs  
Faculty of Mathematics and Physics  
Charles University in Prague  
Ke Karlovu 3  
121 16 Prague 2, Czech Republic

Dear Professor Zadrapova

**Re: Examiner's Report - Astrophysically important processes in collisions of electrons with hydrogen atoms -  
Doctoral thesis by Jakub Benda**

The aim of the thesis work is to "build as complete database of electron-hydrogen scattering cross sections as possible..." such that "the accuracy of the produced results should be superior to the presently available data".

Chapter 1 is a very nice summary of the relevant literature and statement of the aim of the work. The formal theory exposition in Chapter 2 is excellent. The design of the program structure to deliver amplitudes and cross sections is clearly explained in chapter 3 as is the need to use different calculation methods for according to the range of impact energies. For me Chapter 4, where the B-spline application of the ECS method was explained is a highlight of the thesis. The convergence studies are precise and demonstrate how effective the implementation is. The work here is very impressive. The short Chapter 5 explains the database interface.

The calculation results are presented in Chapter 6. The tests with the s-wave model against previous EECS calculations confirm the precision of the present method. The detailed studies of the low energy collisions strengths and comparison with other results are illuminating and provide, in my opinion, new benchmark (and importantly converged) results.

All in all, this has been a very satisfying thesis to review. The presentation and writing is of an excellent standard including the table and figures. There seem to be no obvious typographical errors. I briefly checked to see if ref. [78] was published and could not find it. If the thesis is to be finalized before it is I suggest removing the [?] marks and replacing with [in press].

I have no hesitation in recommending this thesis outstanding and congratulate Jakub Benda.

Yours sincerely,

Professor Andris Stelbovics  
Pro Vice Chancellor, Science and Engineering