

Status on the Recovery of Voyager Plasma Electron Observations at Jupiter

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ABSTRACT

We give status report on the recovery of Voyager 1 and 2 plasma electron observations during their Jupiter flybys. The plan is to complete this analysis including new results never published before. The original summary data tapes and later data files were evidently permanently lost along with our past analysis results of the plasma electron observations except for that shown in previous publications. These summary data tapes included the plasma ion and electron raw data files, status words needed to convert data numbers to currents, SEDR data with trajectory and attitude information and magnetic field measurements. In addition to recovering the plasma electron plasma observations (electron intensities and fluid parameters of the thermal and suprathermal electron populations, respectively), the SEDR trajectory information during the outbound passes were lost but fortunately in the past the SEDR files were converted to Spice Kernals, so this unexpected problem was solved. In addition, we had to rewrite our read routine so it looked like the previous read routines so the rest of the Fortran code could be used; the Fortran code had to be modified to work with the latest compilers and computer platforms. We will report on the status of our work originally funded under the Planetary Data Archiving, Restoration, and Tools (PDART) program but now being funded by the Internal Scientist Funding Model (ISFM) Exosphere Ionosphere Magnetospheres Modeling (EIMM) program at NASA Goddard Space Flight Center.

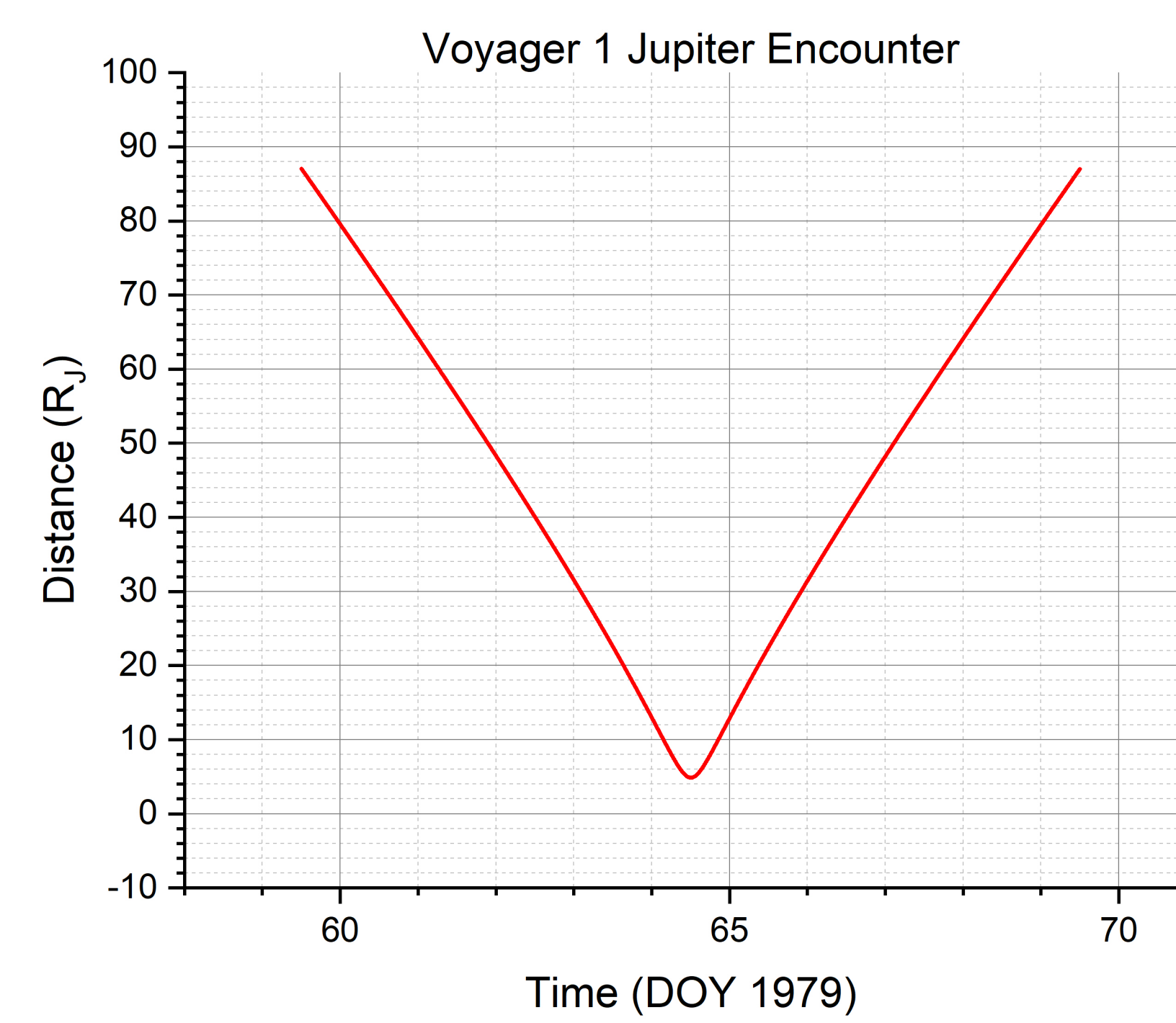


Figure 1. Voyager 1 Jupiter Trajectory

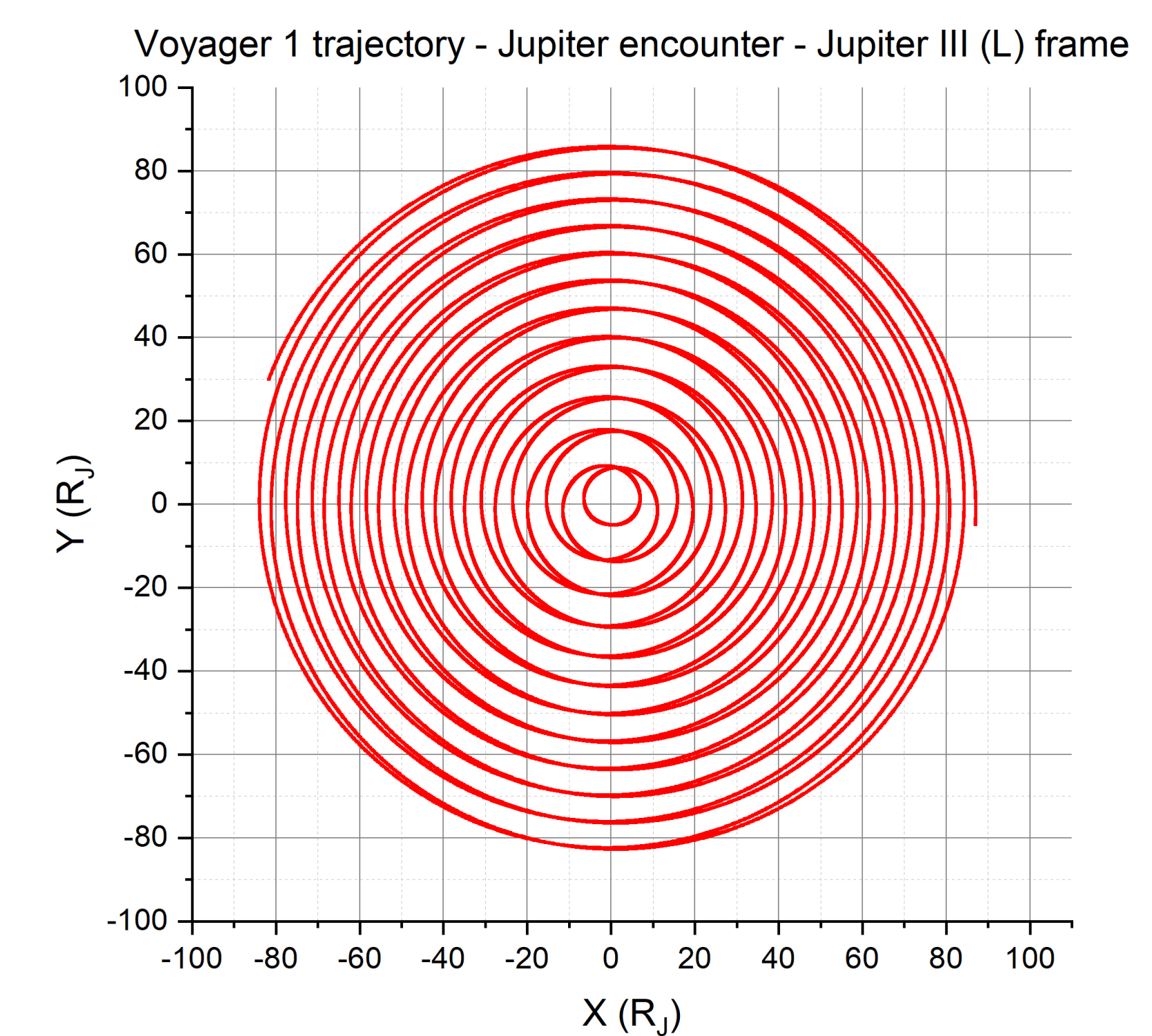


Figure 4. Voyager 1 Trajectory in X-Y Plane.

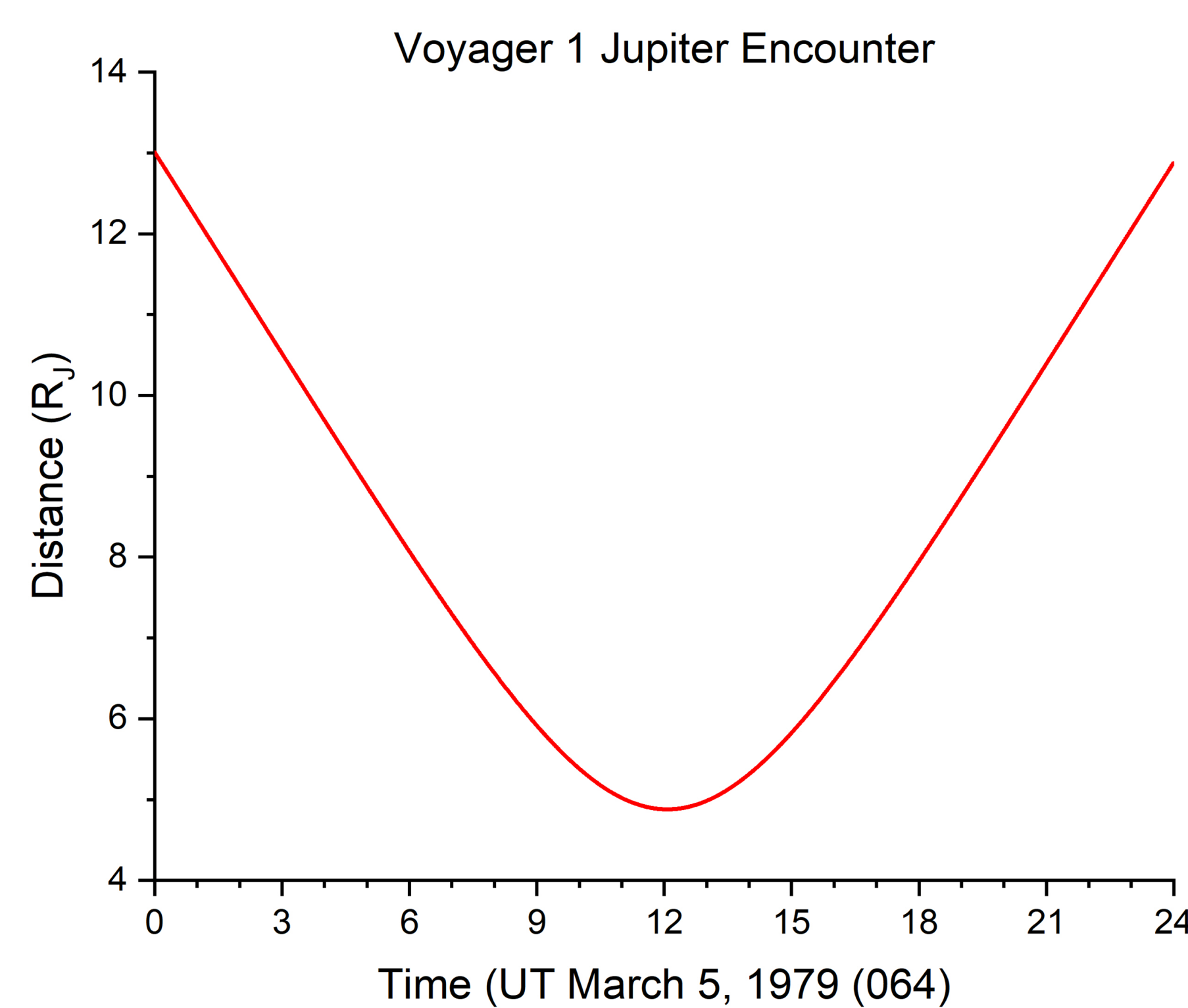


Fig 2. Voyager 1 Radial Trajectory Day 64

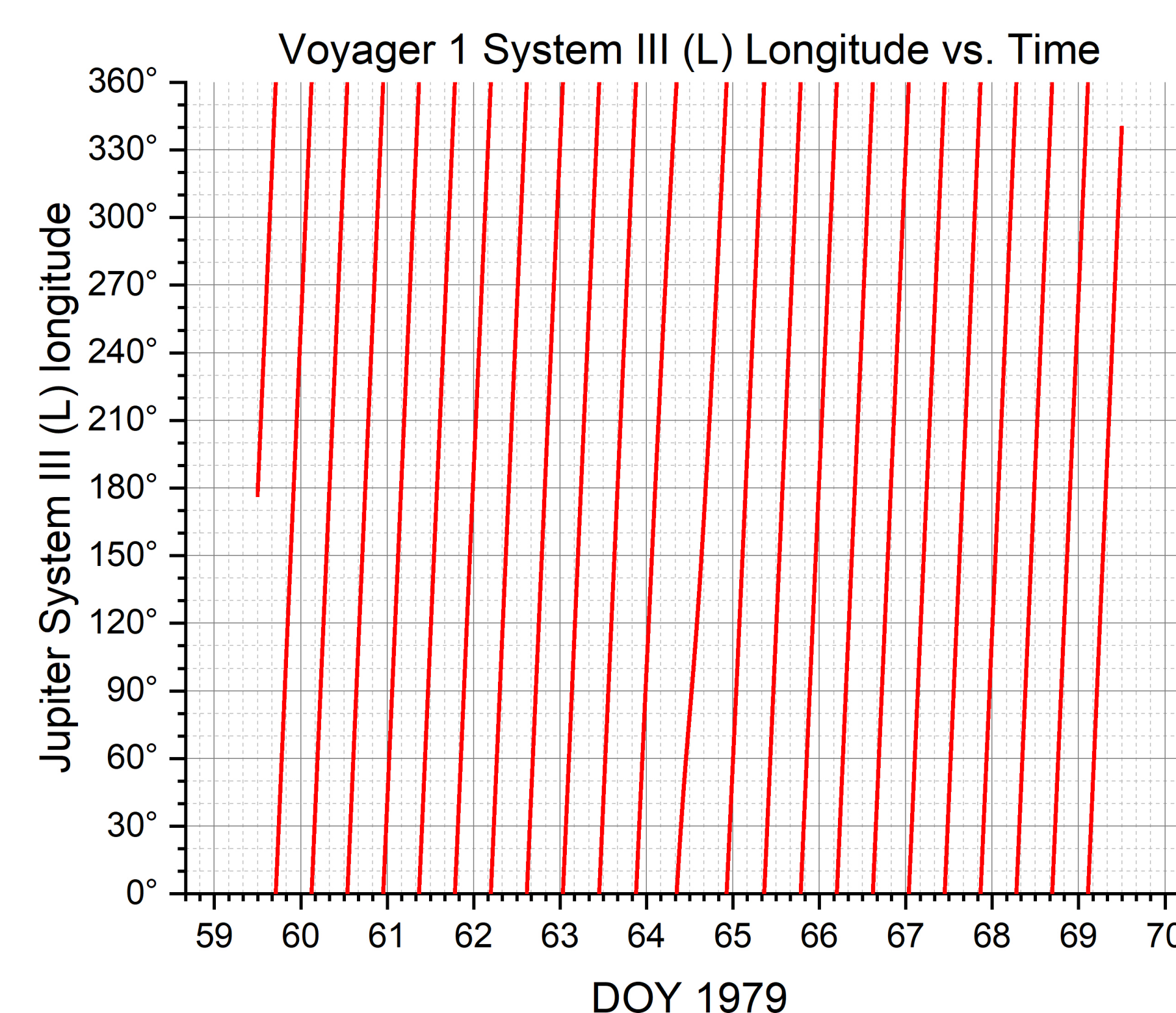


Fig 3. Voyager 1 System III Longitude vs Time

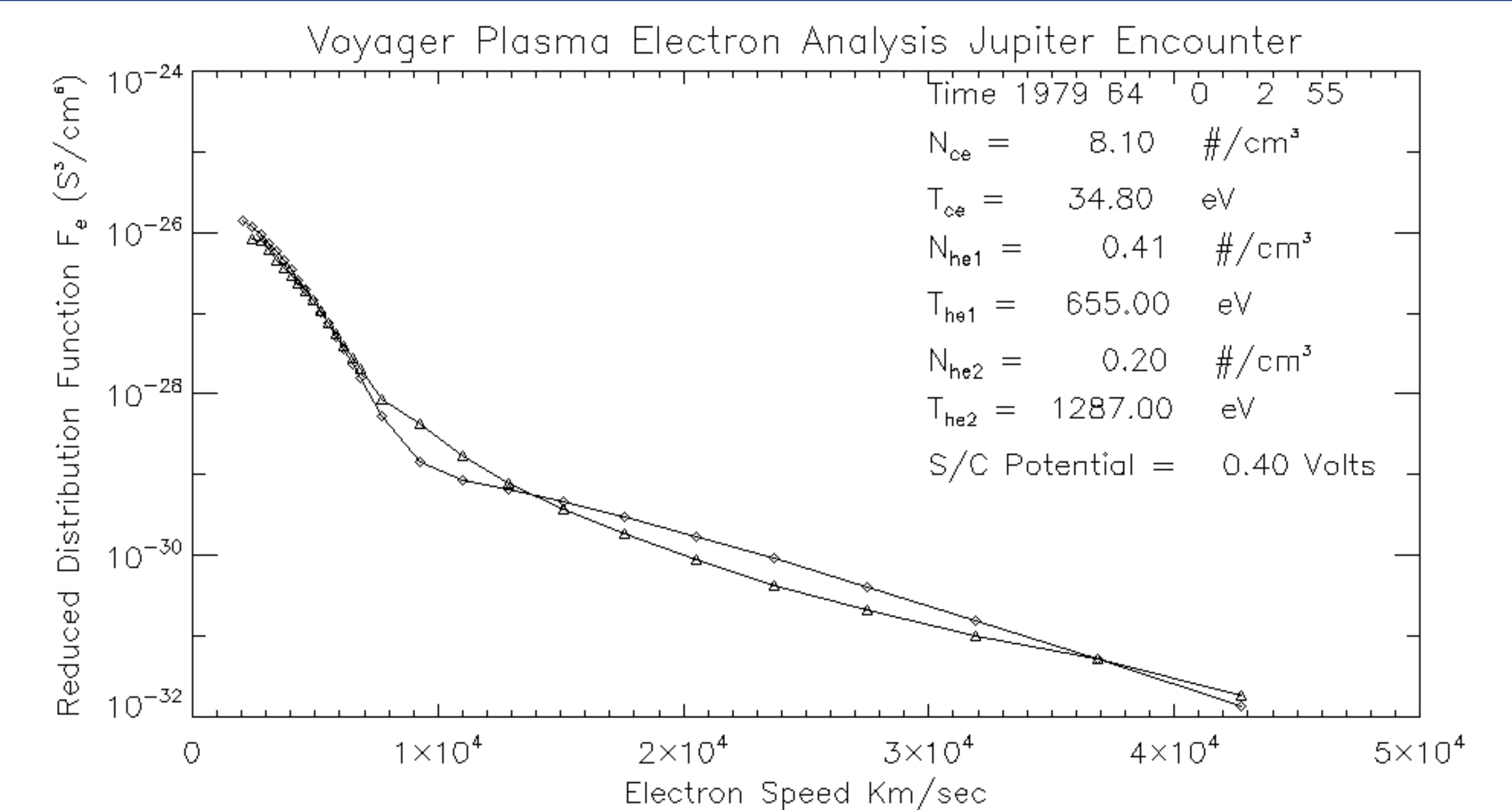


Figure 5. Fit to Reduced Distribution VDF. Triangles are the data and diamonds the fit.

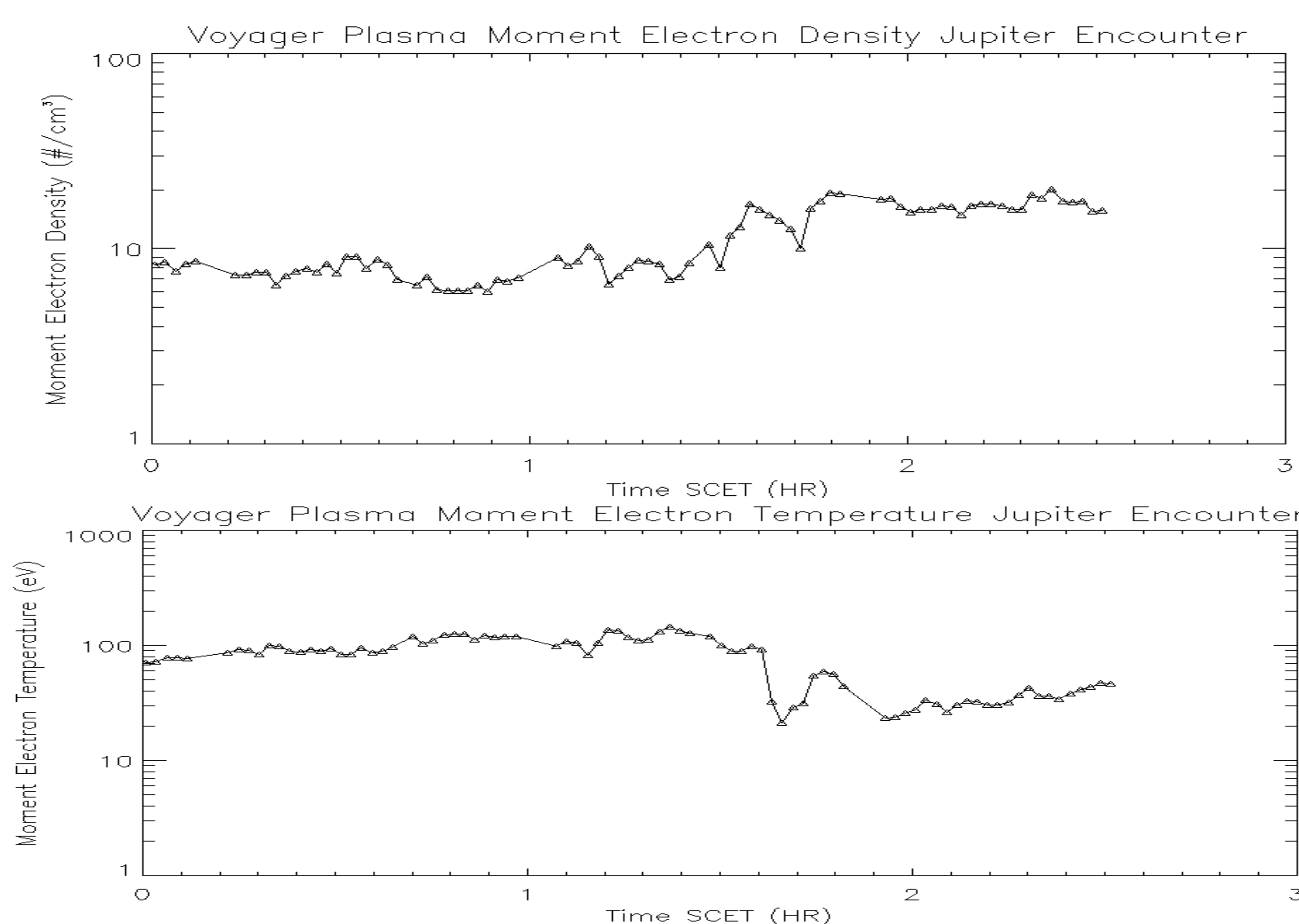


Figure 6. Moment Electron Density and Temperature

Summary

1. Recover data files provided by MIT; done.
 - a. Originally only currents were provided with poor coverage but allowed us to get the code up and running.
 - b. Later files with data numbers were provided by MIT with good coverage and is now being incorporated into our data analysis code.
2. Read routine for reading in currents done, while for reading in data numbers still in progress.
3. The data analysis portion of the code is now running but still some portions not yet tested.
4. For V1 Io Torus region we digitized Fig 3 of Sittler and Strobel, 1987 in order to recover the total electron density. We are now digitizing Fig. A3 in the same paper for the feedthrough current correction 6-10 hours SCET (inbound pass of the Io Torus).
5. Figure 5 shows three Maxwellian fit to the electron reduced distribution function which allows is to estimate the electron distribution function from which velocity moments and electron intensities can be estimated. Some of this has already been done.