Eckert, W. J. Numerical theory of the five outer planets.

The equatorial rectangular coordinates of the planets Jupiter, Saturn, Uranus, Neptune and Pluto from 1653 to 2060 were determined by numerical integration. All the mutual attractions of the five planets and the sun were included and the integration, at forty-day intervals, was made with an accuracy of fourteen decimals.

The constants of integration were determined by comparison with all available observations. Two preliminary integrations were made for this purpose, the second covering the interval from 1780 to 1940.

The coordinates from the final integration were rounded to nine decimals for publication. These coordinates together with differences for convenient interpolation and a detailed description of the computation will be published in the *Astronomical Papers of the American Ephemeris*, vol. XII.

The work was planned jointly by G. M. Clemence, Dirk Brouwer and the writer. The discussion of the observations was made at the Naval Observatory for Jupiter and Saturn and at the Yale Observatory for Uranus and Neptune; these parts of the work are described in separate papers. The integrations and the preparation of the tables were done in the International Business Machines Pure Science Department, the integration being performed on the IBM Selective Sequence Electronic Calculator. This project is part of the Company's program in basic research organized by Mr. Thos. J. Watson, Chairman of the Board.

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Green, Louis C., Nancy E. Weber, and Eleanor Krawitz. A comment on the f-sum rule.

The oscillator strengths for all transitions of importance from the $3d$ state of *Ca*II to discrete and continuous p and f states have been computed using wave functions with and without exchange and both calculated and observed energy differences. The total oscillator strengths for these different series and different sets of wave functions and energies are given in the table.

Series	Without Exchange Obs.	Without Exchange Calc.	With Exchange Obs.	With Exchange Calc.
$3d$-p	0.087	−0.383	−0.226	−0.386
$3d$-f	2.278	1.361	1.533	1.405
Total	2.365	0.978	1.307	1.019

Comparisons of these sums with the predictions of the f-sum rules strongly suggests that the calculated, rather than the observed, energy differences should be used in computing oscillator strengths.

The two sets of f-values calculated for the $3d$-nf series using wave functions with and without exchange and the calculated energy differences satisfy the partial f-sum rule equally well. In spite of this approximate equality of the f-sums, the individual f-values are very different. For example, the f-values found for the $3d$-$4f$ transition with and without exchange are 0.226 and 0.651, respectively. These results make it very clear that the fact that a given set of f-values satisfies the f-sum rules does not establish the physical reliability of those values.

Probably the most reliable of the sets of f-values computed here are those found from wave functions including exchange and the calculated energy differences. On this basis the total f-value for the $3d$-f continuum is found to be 0.925. This is even larger than earlier work had indicated. It seems certain that this continuum is considerably stronger than one would predict on the basis of a comparison with hydrogen.

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Haverford College,
and Watson Scientific Computing Laboratory,
New York, N. Y.

Haddock, Fred T., Cornell H. Mayer, Timothy P. McCullough, Donald R. White, and Russell M. Sloanaker. The measurement of 3 and 10 centimeter radiation during the total solar eclipse of September 12, 1950.

The technique of measurement and of reduction of data taken during the total eclipse of September 12, 1950, on the solar emission at 3 and 10 cm wave lengths is discussed. The measurements were made with chopper-type radiometers attached to six-foot paraboloidal reflectors mounted equatorially. The full sun reading was several hundred times the system fluctuation level, and the sensitivity was frequently calibrated by direct comparison with a black body at elevated temperature. Trial runs were made on the days preceding the eclipse in order to determine the variation in background emission and ground reflection with respect to zenith distance. The effects of background radiation