ABSTRACTS OF PAPERS FROM OTHER JOURNALS


The paper describes a photographic method which can be used for processing two-dimensional images in which it is necessary to suppress minor and sporadically occurring regions but, on the contrary, to stress extensive formations. The paper has been divided into two parts. In the first, a method of graphical surface integration is described, which makes use of optical transformation in processing the original image by an unfocussed camera. In the second part, the method of processing the transformed image by means of the study of the macrostructural density of the distribution of Ca II flocculae on the solar surface is demonstrated. (Author's abstract.)


Line broadenings and shifts of 3 neutral and 3 ionic lines of magnesium are investigated using a gas pressure arc. The broadening parameters for van der Waals interaction and for electron impact are obtained and are compared with theoretical values.

J. C. HENOUX


The paper describes the method of determining the function which defines the conversion of a signal, observed by a broad-band X-ray detector, to the incident energy flux. An exact solution can only be obtained if the spectral distribution of the X-radiation is known. As an example, the conversion function with two ionization chambers has been investigated in the 0–8 Å and 8–12 Å ranges; the chambers were installed in the SOLRAD 8 satellite. Theoretical spectra of the coronal plasma for a model of a homogeneous isothermal source were used. The solution allows for the determining of the effective limits of the wave-band efficiency of the detector. Under these conditions, the variation of the conversion function with the shape of the spectrum is minimum, so that the signal-to-energy conversion does not require the spectral energy distribution to be known accurately. The inaccuracy in determining the chemical composition of the coronal plasma has no substantial effect on determining the conversion function. The spectral sensitivity ranges given and the constant conversion factors used, derived for the spectral distribution of a grey body, are only of a conventional nature with regards to the ionization chambers investigated. (Author's abstract.)


The cross sections for electron impact excitation from the ground state of H, He, Li, and Ne like ions are approximated by interpolation formulae with four parameters.

J. C. HENOUX

The paper describes the method of reducing the intensities of the 5303 Å and 6374 Å coronal lines, observed during the period 1963–1970, to a new scale used at Lomnický Štít since 1 January 1971. (Author’s abstract.)


The paper gives a list of all observations of the yellow coronal line made at Lomnický Štít between 1966 and 1970. (Author’s abstract.)


An isophote map of bright and dark mottles at the center of Hα is given. The relative positions of the mottles are discussed. (Authors’ abstract.)


A method is proposed for the determination of the true continuum for the spectral region where no continuum is visible. The method is based on the use of the characteristic weakening of absorption lines due to blending with a strong line. (Authors’ abstract.)


Abundances of Eu, La and Sm were derived using high resolution sunspot spectra. The results are \( \log A_{\text{Eu}} = 0.70 \pm 0.30 \), \( \log A_{\text{La}} = 2.14 \), \( \log A_{\text{Sm}} = 2.30 \). Sm shows no, La a slight, and Eu a strong dependence of \( \log A \) on the lower excitation potential. This indicates the presence of systematic errors in the oscillator strengths used here. (Author’s abstract.)


High resolution and high sensitivity spectra of decametre noise storms show the presence of a large number of split-pair and single narrow-banded bursts which have a strong tendency to appear in chains which drift in frequency in a manner similar to the type III bursts. The main characteristics of such chains (named type IIIb bursts) are studied. It is shown in particular that type IIIb are often precursors of a normal type III burst. Some conclusions about the nature of the exciter of type IIIb and type III bursts are presented. (Authors’ abstract.)


The influence of the ‘cut off \( \alpha \)-effect’ (\( \alpha \) is set to zero if the field exceeds a certain value) on the one-dimensional dynamo waves is studied. Oscillatory antisymmetric dynamos are computed and compared with the solar cycle. The oscillation periods of such solutions are about twice the periods resulting from the linear theory, and they decrease with increasing field amplitude. The solutions also show the characteristic asymmetry between the rising and falling parts of the cycle. (Author’s abstract.)

The evolution of the axisymmetric rotation of the radiative interior of the Sun is investigated within the framework of Eddington-Sweet theory. The solar wind torque effect, as well as the Eddington-Sweet type circulation is taken into account. The numerical calculation by truncated Legendre expansion by two terms shows the Eddington-Sweet circulation, carries the angular momentum inwards and spins up the deep interior. Since the solar wind torque extracts the angular momentum from the outer convection zone, the latter is suffered by two angular momentum sinks, and actual estimation gives out too short a time scale of decline of the surface angular momentum of the order of $10^{-8}$ yr. This suggests that there must be an angular momentum pumping mechanism from deep interior.

Y. Uchida


Abundances and excitation temperatures of metals in the low chromosphere are determined as functions of height, using the 1972 eclipse data of the joint expedition of HAO and SPO, without the assumptions of local thermodynamic equilibrium and a constant source function. Lower term densities are determined from the self-absorption of flash lines, and estimates are made for the abundances of iron, titanium, chromium, scandium, strontium, barium and zirconium. Excitation temperatures for most of the lines are shown to be decreasing in the outer regions of the atmosphere, but those for some of the lines exhibit the opposite behavior. Relative abundances of metallic elements in the upper layers seem to be the same as the photospheric values, but relative to hydrogen they increase with height. It is likely that these apparent differences of relative abundances between the upper and lower layers originate from inhomogeneities in the chromosphere. (Author's abstract.)


The problem of the radiative equilibrium in a cylinder surrounded by a medium with a given temperature distribution is considered. Taking the absorption coefficient to depend linearly on the optical depth an analytical solution is obtained.

The solution is applied to the problem of the temperature distribution in a photospheric tube ('dots') inside the sunspot umbra fed from downside.

G. Vassiliieva


Properties of funnel prominences are deduced from prominence surveys and prominence films. Association with active regions is discussed for 284 funnel prominences observed in Hα filter from January 1956 to December 1961. No conspicuous preference for a specific spotgroup type, neither in Zürich, nor in Mt. Wilson magnetic classification, has been found. Funnels are often associated with plages without spotgroups. The outflow of the Hα material from the prominence body is connected with internal motions. A characteristic feature of internal motions is a substantial simplification of the prominence structure: the last phase of some funnels is one or more smooth regular loops. (Author's abstract.)