ABSTRACTS OF PAPERS FROM OTHER JOURNALS


A description is given of a bright arch prominence that appeared on the west limb on April 24, 1971. The arch rose to a maximum height of $6 \times 10^4$ km and decelerated with $\frac{1}{3}$ of solar surface gravity from the initial velocity of 75 km s$^{-1}$. It was characterized by a widely extended H$\alpha$ emission at the outer boundary in the early stage of its ascending motion, by a complex change in the H$\alpha$ emission profile towards the maximum phase at the top of the structure, and by a following quiet final stage. Microwave radio data indicates that it is associated with an enhancement in the thermal radio emission in its early phase.

Y. Uchida


The energy balance and acceleration of electrons by plasma waves in a current layer of a solar flare are considered. Langmuir plasmons are shown to be generated as a result of the development of ion-sound turbulence due to bunch instability. The Langmuir plasmons accelerate the resonance electrons to relativistic energies in the range of 5 MeV–1 GeV. The spectrum of the relativistic electrons, which are leaving the flare’s current layer is $f_\varepsilon \sim e^\varphi \exp \left\{ -\frac{\varepsilon}{\varepsilon_0} \right\}$ for $\varepsilon > \varepsilon_0$.

G. Vasilieva


X-ray spectra have been calculated under the assumption of the electrical current origin of the solar flares. The data observed are in a good agreement with a model discussed.

G. Vasilieva


The electron temperature and the emission measure of three coronal condensations over active regions have been derived from X-ray observations made on the SOLRAD satellite during the 20 May 1966 eclipse. For the analysis it was necessary to distinguish the ‘quiet’ level values from those affected by any activity phenomena. A small X-ray burst occurring during the time of observation can be unambiguously associated with a chromospheric flare, observed in the unocculted western sunspot group. This disclaims Meisel’s (1968, 1970) hypothesis about the reflection of the solar limb at grazing incidence. Correct integral fluxes in the 0–8 Å and 8–12 Å intervals are given.

The X-ray data are compared with the optical and radio data, characterizing the investigated coronal condensations. Good correlation between the 8–12 Å X-ray fluxes and green line intensities of all three coronal condensations signifies that both types of emission are controlled by the corresponding emission measures. The 0–8 Å fluxes, which do not correlate with the green line emission, are sensitive to arbitrary non-stationary processes connected with the formation of small high-temperature regions, or with the acceleration of electrons. (Authors’ abstract.)

Successive pictures of the inner solar corona were taken through a polarizer at three position angles during the total eclipse on March 7, 1970 in Mexico. The spectral interval 5000-7000 Å was defined by the filter and photographic plate sensibility. The polarimetric photos were elaborated by the photographic equidensity method, taking into account the instrumental polarization. From these isophotes the degree of polarization was calculated for the height 0.1-0.5 R☉. At some regions the degree of polarization exceeds the maximum theoretical value by as much as factors 1.3-1.5. The direction of polarization is close to tangential.

G. Vassiliieva


The brightness distribution across the solar disk at a wavelength of 8.6 mm is deduced from observation made by a four-element interferometer with 273 wavelengths span. The brightness distribution at this wavelength is flat from the disk-center to 0.95 R☉ with a limb-brightening just outside the optical disk. This is consistent with the expected coronal contribution at this wavelength. The physical conditions in spicules are inferred by comparing the present result with what is expected from BCA model and models by Vernazza and Noyes. The result suggests that the electron temperature in spicules is less than 6000 K in agreement with Hirayama's value.

Y. Uchida


The quiet Sun brightness distribution at 9 and 3.5 mm wavelengths are presented. The distribution at 9 mm shows definite limb brightening whereas the distribution at 3.5 mm shows slight limb darkening. These distributions and the distribution at 1.2 mm are interpreted in terms of a two-component chromospheric model.

J.-C. Henoux


List of solar radio noise on the 115-cm wavelength recorded at the Astronomical Institute Observatory Ondřejov, over the years 1962–1971. The list is a continuation of the catalogue of 130 cm solar radio noise storms, recorded at Ondřejov during the years 1959–1961. (Authors' abstract.)

V. V. Zaitsev and V. V. Fomichev: 'On the Origin of Chains of Type I Bursts', *Astron. Zhurnal* 49 (1972), 817.

A mechanism for the emission of chains of type I radio bursts with weak (M < 1.5) collisionless shock waves in a plasma with a strong magnetic field (ωH > ωL; ωH and ωL are the gyro frequency and Langmuir frequency of the electrons) is discussed. It is shown that within the limits of the given mechanism it is possible to explain satisfactorily many observed properties of chains of type I bursts (frequency drift, splitting, band width of separate elements of chains, polarization). From the data on chains the distribution of magnetic field and parameters of shock waves in the interval of heights from 2.5 × 10⁹ to 1.5 × 10⁶ km above the photosphere is calculated. Estimates of dimensions of inhomogeneities in the solar corona are obtained. (Authors' abstract.)

Information on the interplanetary medium can be derived from the study of the skewness coefficient of the probability density function of the received intensity: \( \gamma_1 \). Generalizing the work of Mercier (1962) we derive an expression of \( \gamma_1 \) which is valid for all conditions of observation of interplanetary scintillations at sufficiently larger distances from the Sun. (Author's abstract.)


The interest of the skewness coefficient \( \gamma_1 \) to study the interplanetary medium is shown: \( \gamma_1 \) allows to determine the rms values of the phase shift introduced by the interplanetary medium, and its variations with solar distance are less sensitive to source structure than the variations of the scintillation index. The variations of \( \gamma_1 \) with the scintillation index determines the flux density ratio for core-halo models of radio sources.

J.-C. Henoux


By comparing the direct flow of solar X-rays in the 1–6 Å range, recorded by the Intercosmos I satellite, with the recordings of atmospheric and other ionospheric effects the value of the sluggishness \( \Delta t \) of the ionospheric D-region was found to vary. This value clearly depends on the optical composition of the X-rays, so that \( \Delta t \) is small with phenomena displaying larger energies, and \( \Delta t \) increases for lower emission energies and may reach values in excess of 10 min. (Authors' abstract.)


A recurrent property of solar-wind velocity-increase is demonstrated by the observation of interplanetary scintillation of 3C 48 by two long-squared arrays at 69.3 MHz. The recurrence period is about 25 days and shorter than synodic period of 27 days. The difference may be explained by the change of the distance of the closest point on the line of sight to the source from the Sun. A comparison with space-probe data shows that the observed enhancements are associated with two high velocity streams corotating around the Sun. The enhancements in the scintillation index precedes the velocity enhancements by two days, suggesting that the enhanced scintillation index is caused by the compressed plasma regions in front of the high velocity corotating streams.

Y. Uchida