Название: Possible generation mechanisms for PCl pearl structures in the ionosphere based on 6 years of ground observations in Canada, Russia, and Japan
Авторы: Jun, CW (Jun, Chae-Woo); Shiotawka, K (Shiotawka, Kazuo); Conners, M (Conners, Martin); Schofield, I (Schofield, Ian); Poddelsky, I (Poddelsky, Igor); Shvetsov, B (Shvetsov, Boris)
Аннотация: We investigate pearl structures (amplitude modulations) of PCl pulsations simultaneously observed at Athabasca (ATH, 54.7 degrees N, 246.7 degrees E, L = 4.3) in Canada, Magadan (MGP, 60.1 degrees N, 150.7 degrees E, L = 2.6) in Russia, and Moshiro (MOS, 44.4 degrees N, 142.3 degrees E, L = 1.5) in Japan. From 6 years of ground observations, from 2008 to 2013, we selected 84 PCl events observed simultaneously at the longitudinally separated stations (ATH and MGD) and 370 events observed at the latitudinally separated stations (MGD and MOS), all with high coherence (>0.7) of PCl waveforms. We calculated the cross-correlation coefficient (similarity, r) for the PCl pearl structures and found that more than half of the events in both pairs had low similarity (r < 0.7), indicating that most PCl waves exhibit different pearl structures at different stations. We found that high-similarity PCl pearl structures (r > 0.7) at the longitudinally separated stations are concentrated from 6 to 15 UT when both stations are in the nighttime. The similarity of PCl pearl structures tends to show a negative correlation with the standard deviation of the polarization angle in both pairs. The observed repetition period of PCl pearl structures has a clear positive correlation with the repetition period estimated from PCl bandwidth by assuming beating of different frequencies. From these results, we suggest that ionospheric beating effect could be a dominant process for the generation of PCl pearl structures. Beating processes in the ionosphere with a spatially distributed ionospheric source can cause the different shapes of PCl pearl structures at different observation points during ionospheric duct propagation.
Идентификационный номер: WOS:000138002550038
ISSN: 2169-9380
eISSN: 2169-9402

Название: Lightning and electrical activity during the Shiveluch volcano eruption on 16 November 2014
Авторы: Shevtsov, BM (Shevtsov, Boris M.); Firstov, PP (Firstov, Pavel P.); Cherneva, NV (Cherneva, Nina V.); Holzworth, RH (Holzworth, Robert H.); Akbashev, RR (Akbashev, Renat R.)
Аннотация: According to World Wide Lightning Location Network (WWLLN) data, a sequence of lightning discharges was detected which occurred in the area of the explosive eruption of Shiveluch volcano on 16 November 2014 in Kamchatka. Information on the ash cloud motion was confirmed by the measurements of atmospheric electricity, satellite observations and meteorological and seismic data. It was concluded that WWLLN resolution is enough to detect the earlier stage of volcanic explosive eruption when electrification processes develop the most intensively. The lightning method has the undeniable advantage for the fast remote sensing of volcanic electric activity anywhere in the world. There is a good opportunity for the development of WWLLN technology to observe explosive volcanic eruptions.
Идентификационный номер: WOS:000377610300014
ISSN: 1561-8633

Название: P2 pulsations observed around the dawn terminator
Авторы: Imajo, S (Imajo, S. Y.; Yoshikawa, A (Yoshikawa, A.); Uzumii, T (Uzumii, T.); Ohtani, S (Ohtani, S.); Nakamizo, A (Nakamizo, A.); Marshall, R (Marshall, R.); Shevtsov, BM (Shevtsov, B. M.); Akullivan, VA (Akullivan, V. A.); Sukhbaatar, U (Sukhbaatar, U.); Liedloff, A (Liedloff, A.); Umoto, K (Umoto, K.)
Аннотация: We examined P2 pulsations observed simultaneously at low-latitude stations (L = 1.15 - 2.33) around the dawn terminator. Those P2 pulsations observed in the sunlit region were polarized in the azimuthal (D, positive eastward) direction. We found that the D component oscillations in the dark and sunlit regions were in antiphase, whereas the H component oscillated in phase. A statistical analysis indicates that these D component phase reversals occurred about 0.5 h sunward of the dawn terminator at 100 km in altitude, corresponding to the highly conducting E layer. The azimuthal polarization and D component phase reversals related to the dawn terminator cannot be explained by the existing models of low-latitude P2s (e.g., cavity resonance or substorm current wedge oscillations). Similar D component phase reversals were also found on the dusk side although the amplitude of the D component is smaller than that of the H component. We suggest that the meridional ionospheric current in the sunlit region adjacent to the dawn terminator drives the D component oscillations in antiphase with those D oscillations produced by the oscillatory field-aligned current (FAC) on the postmidnight side. The meridional current is expected to form a part of a current system that extends from the postmidnight FAC to the equatorial Cowling current. The D component oscillations in the Northern and Southern Hemispheres are also in antiphase, indicating that the current system is symmetric with respect to the equator.
Идентификационный номер: WOS:000353237600041

Идентификаторы авторов:

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<td>Liedloff, Adam D 7004-2011</td>
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Название: Relation of tropical cyclone structure with thunderstorm activity
Авторы: Shevtsov, BM (Shevtsov, B. M.); Permyakov, MS (Permyakov, M. S.); Potolova, EY (Potolova, E. Yu.); Cherneva, NV (Cherneva, N. V.); Holzworth, R (Holzworth, Robert)
Отредактировано: Matvienko GG, Romanovskii OA
Аннотация: Synoptic and mesoscale cyclone systems over an ocean and seas are often accompanied by thunderstorm activity, which intensity and spatial distribution are modulated by the dynamic structure of these systems. The paper considers a method connecting the parameters of this thunderstorm activity with weather system structures over oceans and seas with mesoscale formation intensities and forms in these systems determined by driving wind vortex fields of scatterometers and by satellite images in visible and infrared ranges. On the example of separate tropical cyclones (TC) of 2005-2013, the relation of lightning discharge frequency and density in the TC area of influence and spatial distribution of driving wind vortex is shown. The work was supported by the Russian-American Grant RUG1-7084-PA-13 in the area of fundamental researches of FEB RAS and CRDF.
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Название: Conference: 21st International Symposium On Atmospheric and Ocean Optics - Atmospheric Physics
Дата проведения конференции: JUN 22-26, 2015
Место проведения конференции: Tomsk, RUSSIA
ISSN: 0927-786X
Запись 5 из 34
Изучение влияния земных осцилляций на звуковые волны в нижних слоях атмосферы России, Японии, Канады и Китая | Author: Jia C.W. (Jia, Chao-Woo), Shikawa K, Shikawa K.K, Connors M, Courtois M, Schofield J, Schofield J., Podolsky I., Podolsky I.G., Shevchenko B (Shevchenko B.)


Аннотация: Мы исследовали возможные механизмы влияния земных осцилляций на звуковые волны в нижних слоях атмосферы России, Японии, Канады и Китая. Мы выбрали несколько станций в этих странах и исследовали влияние земных осцилляций на звуковые волны. Нами было выявлено, что земные осцилляции могут влиять на звуковые волны в нижних слоях атмосферы.

Идентификаторы авторов:

Аннотация: A case study is presented using measurements from the Cluster spacecraft and ground-based magnetometers that show a strong flux enhancement in the inner to outer plasma sheet. On 3 October 2005, Cluster, traversing an ion-scale current sheet at the near-Earth plasma sheet, detected a sudden enhancement of B-z, which was immediately followed by a series of flux rope structures. Both the local B-z enhancement and flux ropes propagated tailward. Approximately 5 min later, another B-z enhancement, followed by a large density decrease, was observed to rapidly propagate earthward. Between the two B-z enhancements, a significant removal of magnetic flux occurred, possibly resulting from the flux rope causing the magnetotail to be globally stretched so that the thinnest sheet formed tailward of Cluster. The thinned current sheet facilitated magnetic reconnection that quickly evolved from plasma sheet to lobe and generated the large earthward moving diapolar flux (DE) followed by a reduction in density and entropy. Ground magnetograms located near the meridian of Cluster's magnetic foot points show two-step B-z enhancements. The positive B-z associated with the first B-z enhancement indicates that the substorm onset signatures propagated from the inner to the outer plasma sheet consistent with the Cluster observation. The more intense B-z features associated with the later DE are consistent with the earthward motion of the Front. The event suggests that current disruption signatures that originated in the near-Earth current sheet propagated tailward, triggering or facilitating magnetic reconnection, thereby preconditioning the magneto-tail for a large substorm enhancement.

Идентификаторы авторов:

Аннотация: A new approach for the time-frequency analysis of acoustic emission of the audible range is proposed. The approach is based on the sparse approximation method. A basic dictionary based on MFIR frames is constructed with allowance for the characteristics of geo-acoustic signals. It is shown that application of the developed method in analyzing real data makes it possible to reveal the internal geo-acoustic pulse structure caused by the features of their sources. The results can be used for diagnosing deformation processes in natural media.

Идентификаторы авторов:

Аннотация: Analysis of the structure of acoustic emission signals of the audible range by the sparse approximation method

Идентификаторы авторов:

Аннотация: A new approach for the time-frequency analysis of sound range acoustic emission by the sparse approximation method

Идентификаторы авторов:

Аннотация: A new approach for the time-frequency analysis of sound range acoustic emission by the sparse approximation method

Идентификаторы авторов:

Аннотация: Analysis of radio silence in connection with lightning activity change in the world lighting centers

Идентификаторы авторов:

Аннотация: Data on March 2013 were used to verify the theory of whistler propagation along a magnetic field tube, from which the recorded whistlers are expected to be associated with lightning discharges in Kamchatka and in magnetically conjugate point in Australia. When comparing the whistlers recorded at AEWINet station in Kamchatka with lightning discharge rates according to the data of the World Wide Lightning Location Network, it was determined that the intensity highest values are associated with lightning in magnetically conjugate points. At the same time there were some small flashes in the intensity which clearly correlated with the activity of American and African sources. Some flashes may be associated with the activity in all three sources in America, Africa and Indonesia.

Идентификаторы авторов:

Аннотация: Features of the Earth surface deformations in the Kamchatka peninsula and their relation to geoaoustic emission

Идентификаторы авторов:
The paper presents the results of investigations of deformation processes in the near-surface sedimentary rocks, which have been carried out in a seismically active region of the Kamchatka Peninsula since 2007. The peculiarities of the experiments on registration of geoflows are an application of a laser triangulation interferometer constructed according to the Michelson interferometer scheme. Besides rock deformations, geoaoustic emission in the frequency range from several hertz to the resonances of different materials in the earth and oceanic hydrospheres is also included in the study. Artificial water reservoirs and their interactions, particularly earthquakes, are also investigated. The oceanic hydrospheres are instrumental in artificial water reservoirs and their effects on the geoflows are also included in the study. The shape and size of the deformation zones in the near-surface sedimentary rocks are distinguished in the geoflow processes at the observation site. During the damage change in the deformations, the geoflow processes rate grows. An increase in geoaoustic radiation is observed.

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Title 11 in 34

Geoaoustic emission response to deformation processes activation during earthquake preparation

Authors: Marapulets, YV (Marapulets, Yu. V.); Shevtsov, BM (Shevtsov, B. M.); Larionov, IA (Larionov, I. A.); Gudoshnikov, MA (Gudoshnikov, M. A.); Shirshov, AO (Shirshov, A. O.); Solodchik, AA (Solodchik, A. A.)


Abstract: The results of geoaoustic emission investigations carried out on the seismogenic Kamchatka Peninsula since 1999 are presented. The experiments are characterized by the application of broadband piezoelectric sound receivers (hydrophones) for recording the emission. The hydrophones were installed at the bottom of natural and artificial water reservoirs. As compared with the standard hydrophones, such receivers allow us to broaden the registration frequency range up to 0.1 Hz-11 kHz. Three-component vector receivers with the same frequency range were used simultaneously to study the spatial structure of the geoaoustic emission and the mode of the medium particle movement in a wave. In the course of the investigations, it was established that anomalies of the geoaoustic emission in the kilohertz frequency range are recorded 1-3 days before strong earthquakes at a distance of a few hundred kilometers from the epicenter. A sharp increase in the amplitude and frequency of the geoaoustic impulses, which resemble microearthquakes in pattern, is observed up to a few tens of minutes to several hours, is interpreted as an anomaly. Signals at such frequencies cannot propagate from the epicenter of preparing earthquakes and represent the response of the medium at the registration point to the change of its stress-strain state. The stress field created through the tectonic orientation of the emission sources, which can be assessed by vector-phase methods. The results of the integrated investigations of the geoaoustic emission and the Earth's surface deformation revealed that anomalies are observed before earthquakes with a considerable increase in the strain rate during both the compression and extension of the near-surface rocks.

Identification number: WOS:000312665900007
ISSN: 1819-7140

Title 13 in 34

Lidar observations: dynamics of lidar reflections of the Kamchatka upper atmosphere and its connection with phenomena in the ionosphere

Authors: Bychkov, BV (Bychkov, V. V.); Shevtsov, BM (Shevtsov, B. M.)


Abstract: The results of Rayleigh lidar sounding of the upper atmosphere over Kamchatka are analyzed in comparison with ionosonde data. A correlation between light backscattering signals at a wavelength of 532 nm and parameters determining the content of plasma in the nocturnal F2 layer of the ionosphere is found. Based on the performed analysis of lidar data and the geophysical situation, a hypothesis about the possible role of Byrdberg atoms in the formation of lidar reflections at ionospheric heights is discussed.

Identification number: WOS:000311322000012
ISSN: 0016-7922

Title 14 in 34

Lidar observations and formation mechanism of the structure of stratospheric and mesospheric aerosol layers over Kamchatka

Authors: Cheremin, AA (Cheremin, A. A.); Novikov, PV (Novikov, P. V.); Shumilov, IS (Shumilov, I. S.); Bychkov, VV (Bychkov, V. V.); Shevtsov, BM (Shevtsov, B. M.)


Abstract: Lidar observations during 2007-2008 in Kamchatka revealed aerosol layers in the upper atmosphere at heights of 35-50 km and in the mesosphere at heights of 60-75 km. It is well known that forces of gas kinetic nature, i.e., photophoretic forces, act on aerosol particles that absorb solar radiation and terrestrial IR radiation; these forces can counteract the gravitational force and even lead to the levitation of these particles at particular heights. The accumulation of particles at these heights may lead to the formation of layer clouds. We calculated these forces for the conditions of lidar observations in Kamchatka. Aerosol layers were observed at heights where particles levitation can occur. Thus, the stratospheric and mesospheric aerosol layers, detected at heights of 30-50 and 60-75 km, respectively, may be due to the effect of the photophoretic force on aerosol particles.

Identification number: WOS:000309230100010
ISSN: 0016-7932

Title 15 in 34

Magnetic local time and latitude dependence of amplitude of the main impulse (MI) of geomagnetic sudden commencements and its seasonal variation

Authors: Shirshov, A (Shirshov, Ato); Tsuji, Y (Tsuji, Yoji); Koschi T (Koschi Takashi); Araki T (Araki, Tohru); Ikeda, A (Ikeda, Akihiko); Uotomi, T (Uotomi Teiji), Bashiev, D (Bashiev, Dimity); Shevtsov, BM (Shevtsov, Boris M.); Nagatsuma, T (Nagatsuma, Tatsuo); Yumoto, K (Yumoto, Kiyohumi)


Abstract: The magnetic local time and latitude dependence of amplitude of the main impulse (MI) of geomagnetic sudden commencements (SC) and its seasonal variation have been investigated using high time resolution data (1-2 sec) geomagnetic data in the latitudinal range 27-79 degrees for the period 1999-2010. The daytime distribution of the SC-MI amplitude in the sub-arctic and middle latitudes (35-66 degrees) is similar to the DP-2 type geomagnetic variation which shows negative and positive changes in the morning and afternoon, respectively. The magnetic field variation is reversed around the magnetic latitude of 63-65 degrees. This suggests that a pair of field-aligned currents (FACs), resembling the region-I (R-I) FACs, is located near the magnetic latitude of 63-65 degrees. The nighttime SC amplitude is enhanced significantly in the low and middle latitudes (27-69 degrees). The enhancement is due to the magnetic effect produced by the SC-MI FACs. In the nighttime auroral latitude (63-65 degrees), the SC amplitude decreases steeply due to the enhanced westward auroral electrojet associated with the compression of the magnetosphere. The size of the diurnal variation tends to increase significantly during the summer. A comparison with that during the winter. This seasonal variation suggests that the DP-2 type ionospheric currents (ICs) and FACs generated during the SC-MI phase are intensified by increased ionospheric conductivities during the summer. It can be concluded that the large-scale MI current system in the ionosphere and magnetosphere is voltage generator.

Identification number: WOS:000308005200004

Identifiers authors: 2012
Запись 16 из 34
Название: A diffusion approach to the statistical analysis of Kamchatka Seismicity
Авторы: Baishev, Dmitry, BM Shevtsov, B. M.; Sagitova, RN (Sagitova, R. N.)
Аннотация: A diffusion approach was used to develop a statistical model of seismicity and to analyze Kamchatka earthquakes in order to detect features in the changes that are typical of random walk processes. We proposed a hypothesis of relationships among events and used an energy criterion to decompose the earthquake catalogue into a set of sequences, with each being a Brownian process with definite spatial, temporal and energy scales. We constructed statistical distributions for these sequences over the number of their times and total energies, as well as distributions of the sequences over distance, time and flight times between events. We discuss non-local properties and memory effects in the random walk under different conditions.
Идентификационный номер: WOS:000303588100004
Идентификаторы авторов:

Запись 17 из 34
Название: An empirical model of the quiet daily geomagnetic field variation
Авторы: Yamazaki, Y. (Yamazaki, Y.); Yamoto, K. (Yamoto, K.); Cardinali, MG (Cardinali, M. G.); Fraser, BJ (Fraser, B. J.); Hattori, P. (Hattori, P.); Kakumatu, Y. (Kakumatu, Y.); Liu, JY (Liu, J. Y.); Lynn, KJW (Lynn, K. J. W.); Marshall, R. (Marshall, R.); McNamara, D. (McNamara, D.); Nagatsuma, T. (Nagatsuma, T.); Nikiforov, NM (Nikiforov, N. M.); Ondouy, RE (Ondouy, R. E.); Ruhimat, M. (Ruhimat, M.); Shevtsov, BM (Shevtsov, B. M.); Shinkawa, K. (Shinkawa, K.); Abe, S (Abe, S.); Uozumi, T. (Uozumi, T.); Yoshikawa, A (Yoshikawa, A.)
Аннотация: An empirical model of the quiet daily geomagnetic field variation has been constructed based on geomagnetic data obtained from 21 stations along the 210 Magnetic Meridian of the Circumpolar Pacific Magneticometer Network (CPMNM) from 1996 to 2007. Using the least squares fitting method for geomagnetically quiet days (Kp = 2) the quiet daily geomagnetic field variation at each station was described as a function of solar activity SA, day of year DOY, lunar age LA and local time LT. After interpolation in latitude, the model can describe solar-activity dependence and seasonal dependence of solar-quiet daily variations (S) and lunar quiet daily variations (L). We performed a spherical harmonic analysis (SHA) on these S and L variations to search for average characteristics of the equivalent external current systems. We found three particularly noteworthy results. First, the total current intensity of the S current system is largely controlled by solar activity while its focus position is not significantly affected by solar activity. Second, we found that seasonal variations of the S current intensity exhibit north-south asymmetry; the current intensity of the northern vortex shows a prominent annual variation while the southern vortex shows a clear semi-annual variation as well as annual variation. Thirdly, we found that the total intensity of the L current system changes depending on solar activity and season; seasonal variations of the L current intensity show an enhancement during the December solstice independent of the level of solar activity.
Идентификационный номер: WOS:000296157800001
Идентификаторы авторов:

Запись 18 из 34
Название: Seasonal features of the appearance of aerosol scattering in the stratosphere and mesosphere of Kamchatka from the results of lidar observations in 2007–2008
Авторы: Bychkov, BV (Bychkov, B. V.); Petrushin, AS (Petrushin, A. S.); Shevtsov, BM (Shevtsov, B. M.); Marichev, VN (Marichev, V. N.); Novikov, PV (Novikov, P. V.); Chemerin, AA (Chemerin, A. A.)
Аннотация: The behavior of the vertical aerosol structure (profiles of the ratio of the coefficients of the backward total and molecular scattering) in the height interval 30-80 km is analyzed from the results of lidar observations in Kamchatka over the period from 2007 through December 2008. The obtained data revealed a regular two-layer aerosol structure in this height range with the maxima of the ratio of the scattering coefficients in the upper stratosphere at heights 35-50 km and in the mesosphere at heights of 60-75 km as well as a relation between seasonal variations in the aerosol stratification and the circumpolar vortex affecting dynamic processes in the atmosphere of midlatitudes. The procedure of including the effect of the Hammargard-MO259.01 PEM, which influences the error in the calculation of the ratio of scattering coefficients, is described.
Идентификационный номер: WOS:000269014000006
Идентификаторы авторов:

Запись 19 из 34
Название: AKR modulation and global Pi2 oscillation
Авторы: Uozumi, T. (Uozumi, T.); Tejiri, Yumoto, K. (Yumoto, K.); Tokunaga, T. (Tokunaga, T.); Soloyev, SI (Soloyev, S. I.); Shevtsov, BM (Shevtsov, B. M.); Marshall, R. (Marshall, R.); Libo, K. (Libo, K.); Ohnari, S. (Ohnari, S.); Abe, S. (Abe, S.); Ikeda, A (Ikeda, A.); Kitahara, K. (Kitahara, K.); Yoshikawa, A. (Yoshikawa, A.); Kawano, H (Kawano, H.); Iwana, M (Iwana, M)
Аннотация: In this report we present a temporal relationship between ground Pi2 and aerosol kilometric radiation (AKR). We analyzed six isolated storm events, which were observed by the MAAGAS/CPMN ground magnetometer network and the plasma wave instrument onboard the Polar satellite. We found that the time derivative of the height-integrated AKR power and the ground Pi2 D component had the same periodicity and that the two were synchronized with each other. When the D component fluctuated with the same (opposite) polarity as the magnetic field variation, the AKR power tended to increase (decrease) during the corresponding interval. An isolated storm event (AE similar to 40 nT) which occurred around 18:19 UT on 24 January 1997, was selected for a detailed study. The behavior of the Pi2 event can be interpreted by the storm current wedge (SCW) and Pi2 propagation models. It is confirmed that the midlatitude and high-latitude D component oscillations can be treated as a proxy of the SCW oscillations, whereas the H component oscillations exhibited some phase shifts by the propagation delay of the Pi2 waves. This is the temporal relationship between the time derivative of the AKR power and the ground Pi2 suggests that the height-integrated AKR power was modulated coherently with the SCW oscillations.
Идентификационный номер: WOS:000292125200001
Идентификаторы авторов:
Author: Yamazaki, Y. (Yamazaki, Y.); Yumoto, K. (Yumoto, K.); Uotani, T. (Uotani, T.); Abt, S. (Abt, S.); Cardinal, M. (Cardinal, M.); McNamara, D. (McNamara, D.); Marshall, R. (Marshall, R.); Shevtsov, B. (Shevtsov, B.); Solovyov, S. (Solovyov, S.)

**Title:** JOURNAL OF GEOPHYSICAL RESEARCH: SPACE PHYSICS

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**Publication Date:** SEP 24 2010

**Abstract:** We reexamined the daily S-q-equatorial electrojet (EEJ) relationship based on these extended magnetometer networks in the east Asian region: (1) the Circum-Pacific Magnetometer Network (CPMN), (2) the International Real-Time Magnetometer Network (INTERNMAGNET), and (3) the World Data Center for Geomagnetism, Kyoto (WDCG). Daily variations of the geomagnetic field for geomagnetically quiet days (Kp < -2) from 1996 to 2005 were analyzed. nighttime eastward-S-q-curvature indices were estimated by S-q-curvature indices were estimated by integrating the north-south component of the S-q field. The corresponding EEJ intensities were estimated from the daily geomagnetic field variations observed at Davao station (dip latitude of 0.84 deg). We discovered that these intensities of daily S-q and EEJ are well correlated on a long-term basis (r = 0.80). The dependence on the solar activity (as indicated by F10.7 and 2.1 cm (day number) of S-q and EEJ variations were examined. It was demonstrated that both daily S-q and EEJ intensity are correlated with similar sensitivities. F10.7 is known to show similarities with solar EUV radiation which causes ionization and heating of the ionosphere. For seasonal dependence, both daily S-q and EEJ intensity show predominant seasonal variations with similar spring-autumn asymmetry. The effect of seasonal changes of the EUV flux into the low-latitude ionosphere is considered. Our results indicate that the daily values of S-q and EEJ react in the same manner, to temporal changes of solar ionization and heating of the ionosphere.

**Identification Number:** WOS:000283274000003

**Identifiers and Authors:**

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Yamazaki, Yoshiko J-9484-2015

**Home ORCID:** 0000-0002-7624-4752

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**ISSN:** 2028-334X

**Title:** Relationship of high-frequency geoaoustic emission and electric field in the atmosphere in seismotectonic process

**Authors:** Marugadze, YV (Marugadze, Yu. V.); Rudenko, OP (Rudenko, O. P.); Mishchenko, MA (Mishchenko, M. A.); Shevtsov, BM (Shevtsov, B. M.)

**Istocnik:** DOKLADY EARTH SCIENCES

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**Abstract:** In July-October 2006 and 2007, combined measurements of geoaoustic emission in the range of 2.0-6.5 kHz, the electric field in the atmosphere near the ground, and meteorological variables were carried out in Kamchatka. Using the nonparametric method of Spearman’s correlation analysis, the relationship between the average hourly values was examined. After excluding results of bad weather (rain, strong and moderate wind, low atmospheric pressure), a highly important negative relationship between disturbances in geoaoustic emission and the electric field were detected. Most probably, it was caused by modification of the strain of near-surface sedimentary rocks at the observation point during a seismotectonic process. The revealed relationship evidence for further manifestation of the lithosphere’s influence on surface atmosphere in a seismotectonic region.

**Identification Number:** WOS:000276562000020

**Identifiers and Authors:**

### Author

Yoshikawa, A (Yoshikawa, A.); Bychkov, BV (Bychkov, V. B.); Shevtsov, BM (Shevtsov, B. M.)

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**Publication Date:** FEB 27 2010

**Abstract:** We examined the correlation between nighttime P2 events detected simultaneously by a frequency-modulated continuous wave (FM-CW) (HF) radar and a ground magnetometer, both located at a mid-latitude (L = 2.05) Magnetic Data Acquisition System station. Eighty-nine P2 events were observed during the 43-day period from 23 September 2006 to 4 November 2006. The variations of the ground magnetic H component and ionospheric Doppler velocity (V_H) exhibited high coherence for 80% of the 83 P2 events for about a half of which the H and V_H variations have the same dominant frequency. For such events, V_H led by 90 degrees in phase, in the midnight sector of 22:00-03:00 LT. The average (east-west electric field) amplitude derived from V_H is 0.27 mV/m. The 90 degrees phase delay was not found for the five events that were observed near dusk and dawn. The phase relation of H and V_H for P2 in the midnight sector may be explained in terms of the radial standing structure of compressional waves, i.e., cavity mode oscillation.

**Identification Number:** WOS:000275037500001

**Identifiers and Authors:**

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**Title:** The STEL induction magnetometer network for observation of high-frequency geomagnetic pulsations


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**Abstract:** The Solar-Terrestrial Environment Laboratory (STEL) induction magnetometer network has been developed to investigate the propagation characteristics of high-frequency geomagnetic pulsations in the Pc1 frequency range (0.5-5.5 Hz). Five induction magnetometers were installed in the period 2005-2008 at Allahabad in Central Asia and Magadan and Parahum in Far East Russia, and Mozdok and Satka in Japan. The sensitivity of these magnetometers is between 0.3 and 1.3 nT at turnover frequencies of 1.7-5.5 Hz. HR’s time pulses are used for accurate triggering of the data sampling. We show examples of Pc2 and Pc3 magnetic pulsations observed at these five stations, as well as the wavelength structure of ionospheric Alfven waves observed at Mozdok. We found that the P1 packets are slightly modulated as they propagate from high to low latitudes in the ionospheric duct. These network observations are expected to contribute to our understanding of Pc1-range magnetic pulsations and their interaction with relativistic electrons by combining the obtained results with future satellite missions that observe radiation belt particles.

**Identification Number:** WOS:000285146900003
Название: Northeastward motion of nighttime medium-scale traveling ionospheric disturbances at middle latitudes observed by an airglow imager
Авторы: Shikohaka, K (Shikohaka, K.); Otsuka, Y (Otsuka, Y.); Nishitani, N (Nishitani, N.); Ogawa, T (Ogawa, T.); Tsugawa, T (Tsugawa, T.); Maruyama, T (Maruyama, T.); Smirnov, SE (Smirnov, S. E.); Bychkov, VV (Bychkov, V. V.); Shevtsov, BM (Shevtsov, B. M.)
Аннотация: Nighttime medium-scale traveling ionospheric disturbances (MSTIDs) observed in 630-nm airglow images at middle latitudes are known to have a predominantly north-northwest-south-southwest phase surface and to move southwestward in the Northern Hemisphere of Earth. However, the mechanisms of MSTID generation and their systematic southwestward motion have not been clarified. In this paper, we report the “northeastward” motion of the MSTIDs observed at Parnatunka, Far East Russia (52.97 degrees N, 158.25 degrees E), using an all-sky 630-nm airglow imager at 2000-2300 UT on 19 August 2007. The MSTIDs moved first southwestward but then back northeastward in the northern part of the images. The northeastward motion of the MSTIDs took place coincident with a F layer height decrease observed by an ionosonde at Parnatunka. The F layer height decrease was also confirmed by an enhancement of the 630-nm airglow intensity, which seemed to propagate from northeast to southwest. This fact suggests that the F layer height decrease was caused by poloidal wind enhancement rather than westward electric field. These observations imply that the F layer height decrease or the poloidal thermospheric wind has some role in the northeastward turning of the MSTID propagation direction.
Идентификационный номер: WOS:000262174700002
ISSN: 0148-0227

Название: Anomalous high-frequency geoaoustic emission as a close earthquake precursor
Авторы: Gordienko, VA (Gordienko, V. A.); Gordienko, TV (Gordienko, T. V.); Krasnopistiev, NV (Krasnopistiev, N. V.); Kuptsov, AV (Kuptsov, A. V.); Larionov, IA (Larionov, I. A.); Marapulets, YY (Marapulets, Yu. V.); Rutenko, AN (Rutenko, A. N.); Shevtsov, BM (Shevtsov, B. M.)
Источник: ACOUSTICAL PHYSICS Том: 54 Выпуск: 1 Стр.: 82-93 DOI: 10.1134/S1063771008010120 Опубликовано: JAN 2008
Аннотация: One of the possible earthquake precursor mechanisms, namely, acoustic emission, is discussed. The phenomenon of acoustic emission consists in the emission of acoustic pulses due to the formation of microfractures and cracks that precede fracture of objects, rock collapse in mines, earthquakes, etc. By the example of the geoaoustic emission observation on the Kamchatka Peninsula in the area of the Avachinskaya Bay and by the analysis of anomalies of this emission that accompany major seismic events, it is shown that anomalous geoaoustic noise is generated by the stress produced in the medium prior to these events. The high-frequency range (4-11 kHz) is most informative for the observation of geoaoustic noise caused by the crack formation processes.
Идентификационный номер: WOS:000252805800012
ISSN: 1063-7710

Название: The Relation Between High Frequency Acoustic Emissions in Near-surface Rocks and the Electric Field in the Near-ground Atmosphere
Авторы: Kuptsov, AV (Kuptsov, A. V.); Marapulets, YY (Marapulets, Yu. V.); Mishchenko, MA (Mishchenko, M. A.); Rutenko, OP (Rutenko, O. P.); Shevtsov, BM (Shevtsov, B. M.); Shcherbina, AO (Shcherbina, A. O.)
Аннотация: A field instrument package was installed for synchronous measurements of acoustic emission in rocks at frequencies of 0.1-10000 Hz and the vertical gradient of electric potential in near-ground atmosphere. These investigations for the first time revealed a relationship between emission disturbances in the kilohertz frequency range due to deformation of near-surface rocks and the electric field. The relationship may be observed both during seismically quiet periods and at the final phase of earthquake precursor periods.
Идентификационный номер: WOS:000205746600007
ISSN: 0742-9465

Название: Deformation and acoustic precursors of earthquakes
Авторы: Dolgikh, GI (Dolgikh, G. I.); Kuptsov, AV (Kuptsov, A. V.); Larionov, IA (Larionov, I. A.); Marapulets, YY (Marapulets, Yu. V.); Shvetsov, VA (Shvetsov, V. A.); Shevtsov, BM (Shevtsov, B. M.); Shirakov, OP (Shirakov, O. P.); Chopin, VA (Chopin, V. A.); Yakovenko, SV (Yakovenko, S. V.)
Идентификационный номер: WOS:000245522800034
ISSN: 1028-334X

Название: Geoaoustic location of earthquake preparation areas
Авторы: Gordienko, VA (Gordienko, V. A.); Gordienko, TV (Gordienko, T. V.); Kuptsov, AV (Kuptsov, A. V.); Larionov, IA (Larionov, I. A.); Marapulets, YY (Marapulets, Yu. V.); Rutenko, AN (Rutenko, A. N.); Shevtsov, BM (Shevtsov, B. M.)
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