JPRS 68913

11 April 1977

CHINA

PEOPLE'S REPUBLIC OF CHINA SCIENTIFIC ABSTRACTS

No. 166

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

U. S. JOINT PUBLICATIONS RESEARCH SERVICE

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

Reproduced From
Best Available Copy

20000302 121

BIBLIOGRAPHIC DATA SHEET	1. Report No. JPRS 68913	2.	3. Recipient's Accession No.
4. Title and Subtitle PEOPLE'S REPUBLIC OF CHINA SCIENTIFIC ABSTRACTS, No. 166			5. Report Date 11 April 1977
			6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201			10. Project/Task/Work Unit No.
			11. Contract/Grant No.
12. Sponsoring Organization Name and Address As above			13. Type of Report & Period Covered
			14.
15. Supplementary Notes			

16. Abstracts

The serial report contains abstracts in scientific disciplines regarding China.

17. Key Words and Document Analysis. 17a. Descriptors

China

_____ Agricultural Science and Technology
_____ Bio-Medical Sciences
_____ Chemistry
_____ Cybernetics, Computers, and Automation Technology
_x_ Earth Sciences
_____ Engineering and Equipment
_____ Electronics and Electrical Engineering
_____ General Sciences
_____ Materials Science and Metallurgy
_x_ Physics and Mathematics

17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group 01, 02, 04, 06, 07, 08, 09, 11, 12, 13, 20

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
Unlimited availability. Sold by NTIS Springfield, Va. 22151	UNCLASSIFIED	28
	20. Security Class (This Page) UNCLASSIFIED	22. Price A03

FORM NTIS-35 (10-70) USCOMM-DC 40329-P71

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22151. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 68913

11 April 1977

PEOPLE'S REPUBLIC OF CHINA SCIENTIFIC ABSTRACTS

No. 166

This serial publication contains abstracts of articles published in selected scientific and technical journals. JPRS is unable to honor requests for original source materials or information as to the availability of full translations of these articles.

CONTENTS

PAGE

TI-CH'IU WU-LI HSUEH-PAO /ACTA GEOPHYSICA SINICA/ Vol 19, No 2, Apr 76. 1

TI-CH'IU WU-LI HSUEH-PAO /ACTA GEOPHYSICA SINICA/ Vol 19, No 3, Jul 76. 6

WU-LI /PHYSICS/ Vol 5, No 4, Aug 76 11

TI-LI CHIH-SHIH /GEOGRAPHICAL KNOWLEDGE/ No 8, Aug 76 18

ACTA GEOPHYSICA SINICA

AUTHOR: SHU Shui [5771 3055]

ORG: The Seismological Brigade of Chengtu, National Seismological Bureau

TITLE: "Action of the Focal Stress Field, Rock Dilatability and Water Diffusion: An Examination With Regard to the Earthquake Source and the Development of its Precursory Phenomena of the Earthquake of Magnitude 7.1 Occurred in Yung-shan, Yunnan Province"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 19 No 2, Apr 76 pp 74-94

TEXT OF ENGLISH ABSTRACT: The earthquake source of magnitude 7.1 occurred in Yung-shan on 11 May 1974 and the process of development of its precursory phenomena have been examined and interpreted from the point of view of the actions of focal stress field, rock dilatability and water diffusion. The earthquake is assumed to be mainly of the horizontal slip type. This study concerns characters of the space distributions of seismic activity and the precursory phenomena accompanying the development of the earthquake source as well as their variation with time. The interrelationship between a variety of precursory phenomena and the possible cause of aftershock occurrence have been investigated. In conclusion, based on the above-mentioned points, some new approaches for earthquake prediction have been suggested.

AUTHOR: WU K'ai-t'ung [0702 7030 4827]
YUEH Ming-sheng [1971 2494 3932]
WU I-ying [2976 1406 5391]
TS'AO Hsin-lin [2580 2450 3781]
CH'EN Hai-t'ung [7115 3189 6639]
HUANG Wei-ch'iung [7806 0251 8825]
T'IEN K'ang-yuan [3944 2123 2266]
LU Shou-te [4151 1108 1795]

ORG: WU of Institute of Geophysics, Chinese Academy of Sciences; YUEH of Seismological Bureau of Liaoning Province; WU,TS'AO, CH'EN, HUANG, T'IEN, LU of Institute of Geophysics, Chinese Academy of Sciences

TITLE: "Certain Characteristics of Hai-ch'eng Earthquake (M = 7.3) sequence"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 19 No 2, Apr 76 pp 95-109

TEXT OF ENGLISH ABSTRACT: This paper deals with the seismicity background before the Hai-ch'eng earthquake of 4 February 1975, the earthquake sequence, and its space distribution. Normally, there has been very low seismic activity around the meizoseismal region of the Hai-ch'eng eqrthquake. But since 1 February 1975, 527 foreshocks were recorded at the Shih-p'eng-yu seismological station located about 20 km from their epicenters. The epicenters of such

foreshocks are densely concentrated. The signs of the initial motion of their P waves are about the same. With respect to their time of occurrence, the succession appeared as concentration of foreshocks, then a period of quietness and finally the main shock. Following the main shock there occurred a great many after-shocks. The direction of the major axes of the isoseismal lines of the main shock within the meizoseismal area coincides with that of the region of aftershocks distribution and the direction of A nodal plane of the earthquake fault solution. From this, it has been inferred that the strike of the dislocating fault plane of the main shock is NWW. It seems to be a left lateral horizontal slip fault with high dipping angle. Some discussions are also made in connection with a possible method of earthquake prediction immediately before such earthquake sequence.

AUTHOR: WANG Chen-sheng [3769 2182 5116]
WANG Chou-yuan [3769 0719 0337]
KU I-p'ing [7357 0308 5493]
HSIUNG Hsiao-i [3574 2556 2496]

ORG: All of Lanchow Seismological Brigade, National Seismological Bureau

TITLE: "A Preliminary Investigation of the Limits and Certain Features of the North-South Seismic Zone of China"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 19 No 2, Apr 76 pp 110-117

TEXT OF ENGLISH ABSTRACT: The North-South Seismic Zone of China has been proposed only recently. There are many questions regarding this zone which need to be discussed. In this paper we try to describe the limits of this zone, and to show certain aspects of its activity from the point of view of the time, space, and magnitude distributions of historical and contemporary earthquakes occurred in this zone. We find that this zone extends nearly along the meridian 104°E, all the way from North to Sout; it is divided into two sections at about the latitude 33°N. It seems that the locations of epicenters of large earthquakes have been migrating from the north toward the south section since 1700 A.D., indicating possibly the two sections of the zone can be connected as one. This point may be further evidenced by the unison of focal mechanism solutions of recent earthquakes occurring in this zone.
This paper was received for publication on 19 August 1974.

AUTHOR: YAO Hsiao-hsin [1202 1321 2450]

ORG: Institute of Geophysics, Chinese Academy of Sciences

TITLE: "Rupture Velocity and Earthquakes"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 19 No 2, Apr 76 pp 118-124

TEXT OF ENGLISH ABSTRACT: A simulation experiment using the fracturing of two-dimensional brittle glass plates is designed to study the propagation process of fracture in a brittle medium. From the experiment it is found that the propagation of fracture has two distinct modes. One can be named "creep fracture" which has an extremely low rupture velocity; whereas the other is termed "burst fracture," of which the rupture velocity is high. The rupture velocity of the latter is greater than that of the former by the order 10^7. Relating the fracturing phenomena in the laboratory to earthquakes and other natural dilapidation phenomena, and taking the local process of earthquakes as a fracture process, we come to the conclusions that the creep fracture may occur before a dilapidation on a large scale, and during the fracture process of earthquakes, particularly during the interval between the foreshocks and the mainshock.

AUTHOR: LIU Ch'un [0491 2797]
Ch'eng Kuo-liang [4453 0948 5328]
YEH Su-chuan [0673 4790 1221]
CHU Hsiang-yuan [2612 3276 0337]
LIN Chin-lu [2651 6855 4389]
LI Su-lin [2621 4790 3781]

ORG: All of Institute of Geology, Chinese Academy of Sciences

TITLE: "The Paleomagnetic Study on Some Cainozoic Basalt Groups in Vicinity of Nanking and the Preliminary Determination of its Geological Ages"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 19 No 2, Apr 76 pp 125-137

TEXT OF ENGLISH ABSTRACT: In eastern China Cainozoic basalts are widely distributed, but its geological ages are still a problem and discussed among geologists. For that reason two typical sections of basalts located near Nanking have been studied by the a.c. demagnetizing technique of rock samples. It is shown that their remanent magnetism seems to be very stable. The rock samples collected from the Fang-shan basalt group in district Chiang-ning give the mean direction of $D_r = 195^\circ 29'$, $J = -54^\circ 9'$ with a mean intensity of magnetization 8.1×10^{-4} CGSM, corresponding to a palaeomagnetic polar position of $\lambda_p = 192^\circ 35'$E, $\phi_p = 76^\circ 47'$ N; and the rock samples collected from the Ling-yen-shan basalt group in district Liu-ho give the mean direction of

[continuation of TI-CH'IU WU-LI SHEUH-PAO Vol 19 No 2, 1976 pp 125-137]

$D_r = 354^\circ 44'$, $J_r = 42^\circ 12'$ with a mean intensity of magnetization 26.4×10^{-4} CGSM, corresponding to a palaeomagnetic polar position of $\lambda_p = 329^\circ 38'$E, $\phi_p = 80^\circ 36'$N. Based on the above results some conclusions may be obtained as follows: 1. The polarity of rocks from the Ling-yen-shan basalt group is distinctly different from that of the Fang-shan basalt group. The polarity of the former is normal, possibly comparable with the Brunhes epoch; whereas the polarity of the latter is reversed, comparable with the Matuyama epoch. 2. The paleomagnetic polar position obtained from rocks of the Ling-yen-shan basalt group appears to be nearer to the present geographic pole than that from the Fang-shan group, showing the difference of their time eruption, the former was younger than the latter. 3. The paleolatitudes in which both the Ling-yen-shan and Fang-shan basalt groups were formed are considered as intermediate latitudes with sub-tropical climate. 4. Comparing with the paleomagnetic data for rock ages from various regions of the world and referring to the animal fossils contained in the underlying and overlying beds of this two basalt groups and also the petrological properties, it is more reasonable to consider the geological ages of the Ling-yen-shan basalt group and the Fang-shan basalt group as Q_2- Q_3 and N_2 - Q_1 respectively.

AUTHOR: LIANG Hsi-t'ing [2733 3078-6855 1694]

ORG: Nan-k'ai University

TITLE: "The Longitudinal Geometric Factors for the Three-Electrode System of Lateral Logging"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 19 No 2, Apr 76 pp 138-146

TEXT OF ENGLISH ABSTRACT: As the continuation of LIANG's article by the same title in ACTA GEOPHYSICA SINICA Vol 18 No 4, 1975 pp 284-296, in this present paper the longitudinal property of the three-electrode system of lateral logging tool is discussed. All the premiss are the same as in the first article, except the media are now considered as stratified in structure and the influences of the bore hole and of the invaded zone were neglected. The approximate electric potential fields and the longitudinal geometric factors are given.

AUTHOR: HSU Min [1776 2404]
LAN Te-lun [6351 1795 0243]
NING Hsueh-jung [1337 1331 2837]
CHANG Lai-feng [1728 0171 7364]
WANG Hsin-po [3769 2450 3134]
LIU Hsiao-hung [0491 2556 4767]

ORG: Institute of Geophysics, Chinese Academy of Sciences

TITLE: "Digital Coding Clock and Calendar"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 19 No 2, Apr 76 pp 147-150

TEXT OF ENGLISH ABSTRACT: A crystal clock and calendar was developed in our seismic observations. The time accuracy of the clock is $< 3 \times 10^{-9}$/day. It is built of MOS IC and the display consists of a group of miniature fluorescent display tubes. The clock and calendar data are also given in series code format as well as the normal output of hour, minute and second time marks.

6168
CSO: 4009

ACTA GEOPHYSICA SINICA

AUTHOR: CHIN Yen [6855 0917]
CHAO I [6392 3015]
CH'EN Yu [7115 4417-7306]
YEN Chia-ch'uan [6768 1367 0356]
CHO Yu-ju [0587 6877 1172]

ORG: CHIN of Institute of Geophysics, Chinese Academy of Sciences; CHAO of the Seismological Brigade of Canton, National Seismological Bureau; CH'EN, YEN, CHO of Institute of Geophysics, Chinese Academy of Sciences

TITLE: "A Characteristic Feature of the Dislocation Model of Foreshocks of the Hai-ch'eng Earthquake, Liaoning Province"

SOURCE: TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] Vol 19 No 3, Jul 76 pp 156-164

TEXT OF ENGLISH ABSTRACT: A characteristic feature of the dislocation model of the foreshocks of the Hai-ch'eng Earthquake is their uniformity. It is indicated that the ratio of the maximum vertical amplitudes of the $\overline{P}$ and $\overline{S}$ waves recorded at each station appears quite stable. By comparing with five swarms of earthquakes occurred elsewhere in China, this may be helpful in distinguishing foreshocks of an earthquake sequence from an earthquake swarm.

AUTHOR: WANG Ch'ien-shen [3769 6197 6500]
LIU Yuan-lung [0491 0337 7893]

ORG: Both of Institute of Geophysics, Chinese Academy of Sciences

TITLE: "Framework of the Crustal Structure of the Southern Part of Liaoning Province"

SOURCE: TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] Vol 19 No 3, Jul 76 pp 165-176

TEXT OF ENGLISH ABSTRACT: To study the crustal structure of the southern part of Liaoning Province, which is the geological background of the occurrence of the Hai-ch'eng Earthquake, M = 7.3. The available gravity data of the region and the method of "compressed mass plane" suggested in this paper were used to compute the depth of the Mohorovicic Discontinuity, from gravity anomalies after removing the effect of the superficial sedimentary layers and shallow geological structure. In addition, the principle of "density difference" was adopted to separate the effect of the Conrad Discontinuity. The distribution of these two discontinuities in southern Liaoning Province was obtained, basing on the results of computations of 13 gravity profiles. According to the relief of the Mohorovicic Discontinuity, this part of the Liaoning Province may be divided into three elongated regions, northeast-southwest in direction: the central, southeastern and northwestern. The central region is

[continuation of TI-CH'IU WU-LI HSUEH-PAO VOL 19 No 3, 1967 pp 165-176]

an uplift of the upper mantle, lowering toward the northeast and extending southwestward into the Pohai Gulf. It is southeastern flank is much steeper than the northwestern flank, both sides slope down more or less in steps. On this large tectonic background, a series of secondary structures of considerable size are located. The thickness of crust on this uplifted region is 31-32 kilometers, but it becomes about 30 kilometers along the eastern edge. In the southeastern region, the crustal thickness is 34-35 kilometers in general, maximum, 38 kilometers. In the northwestern region, the crustal thickness increases toward northwest, from 34 to 40 kilometers. The Hai-ch'eng Earthquake occurred on the steeper southeastern slope of the central uplifted region. In this paper, a brief description of the methods of computation is also given and some problems are discussed.

AUTHOR: NIU Chih-jen [3662 1807 0088]
SU Kang [5685 0474]

ORG: Both of the Seismological Brigade of Shansi Province

TITLE: "The "Pursuing Model" for the Development of the Source of An Earthquake"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] Vol 19 No 3, Jul 76 pp 177-195

TEXT OF ENGLISH ABSTRACT: In this paper, the authors have proposed a one-dimensional model for the development of the source of an earthquake. On the basis of this model, the process of development of the source of an earthquake and the characteristics of variation of some physical quantities before the earthquake are analyzed by methods of mathematical physics. From the results, the "Pursuing Model" for the development of the source of an earthquake have been proposed. Finally, with this model, the causes of anomalous changes of longitudinal wave velocity and crustal deformation, etc. can be explained. It is shown that the pursuit model is a possible mechanical basis for the further study of precursory phenomena of earthquakes.

AUTHOR: FENG Te-i [7458 1795 4135]
CHENG Szu-hua [6774 2448 5478]
FU Cheng-hsiang [0265 1767 4382]
KAO Shih-lei [7559 0013 4320]
LO Jui-ming [5012 3843 6900]
LI Ping-ts'an [2621 3521 3503]
SHENG Kuo-ying [4141 0948 5391]

ORG: All of the Seismological Brigade of Lanchow, National Seismological Bureau

TITLE: "Preliminary Study of the Velocity Anomalies of Seismic Waves Before and After Some Strong and Moderate Earthquakes in Western China:(I) The Velocity Ratio Anomalies"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] Vol 19 No 3, Jul 76 pp 196-205

TEXT OF ENGLISH ABSTRACT: In this paper are discussed the preliminary results of the velocity ratio anomalies of seismic waves before and after some strong and moderate earthquakes ($M_s > 5.0$) occurred in Western China in recent years. Some general characteristics of the V_p/V_s anomalies are discussed, namely, the form of the curves of the V_p/V_s variation with time, certain characteristic values (the duration and the amplitude) of the V_p/V_s anomalies and their statistical distribution. Besides, the relations between such characteristics

[continuation of TI-CH'IU WU-LI HSUEH-PAO Vol 19 No 3, 1976 pp 196-205]

of the V_p/V_s anomalies and the types of earthquake sequences, the focal depths and the mechanisms of earthquakes are also discussed. A search is made for correlations between the V_p/V_s anomalies and individual V_p, V_s anomalies. And finally, it is pointed out briefly the relation between the seismic activity of a region and the V_p/V_s anomaly.

AUTHOR: CH'EN Yun-t'ai [7115 6663 3141]
LIN Pang-hui [2651 6721 1979]
LI Hsing-ts'ai [2621 5281 2088]
WANG Miao-yueh [3769 1181 2588]
HSIA Ta-te [1115 1129 1795]
WANG Hsing-hui [3769 5281 6540]
LIU Wan-ch'in [0491 8001 3830]
LI Chih-yung [2621 1807 0516]

ORG: CH'EN, LIN, LI, WANG of Institute of Geophysics, Chinese Academy of Sciences; HSIA, WANG of the Seismological Brigade of Chengtu, National Seismological Bureau; LIU, LI of Institute of Geophysics, Chinese Academy of Sciences

TITLE: "The Determination of Source Parameters for Small Earthquakes in Ch'iao-chia and Shih-mien and the Estimation of Potential Earthquake Danger"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] Vol 19 No 3, Jul 76 pp 206-233

TEXT OF ENGLISH ABSTRACT: Using the observational data of small earthquakes which occurred in Ch'iao-chia and Shih-mien, it is found that the half period of first P arrivals is nearly constant for the shocks of small magnitudes, and increases proportionally with magnitudes for larger earthquakes. It is also pointed out that the logarithm of the amplitudes of the initial motion of P-waves increases proportionally with the magnitudes. Taking a radially expanding circular shear crack with uniform dislocation as the theoretical model

[continuation of TI-CH'IU WU-LI HSUEH-PAO Vol 19 No 3, 1976 pp 206-233]

of the moderate and small earthquake sources, the far-field displacement of seismic body waves radiated from such a model is derived. Bu using the expression of far-field displacement, the quantitative relations between the source parameters, wave velocities and the half period, the amplitude of the first arrivals are inferred, and consequently, the empirical relationships between the half period as well as the amplitude of the first P arrivals and the magnitude of earthquakes are explained. Considering the attenuation and dispersion of waves in the medium, the effect of the gree surface as well as the response characteristics of the seismograph instruments, the theoretical seismograms from this dislocation source are synthesized by the convolution technique, and a method by which the source parameters as well as Q value of the medium can be directly determined from the half period and the amplitude of the first P arrivals on the observed seismograms, is proposed. By applying the present method, the source parameters of small earthquakes as well as Q values of the medium of the two regions mentioned above are estimated. The Q values of the medium of the Ch'iao-chia region and the Shih-mien region are 620 and 560, respectively. The stress drops of the small earthquakes in the Shih-mien region are estimated to be about 2 to 30 bars, and that of the small earthquakes in the Ch'iao-chia region, are rather low and close to each other, the mean value of which is about 1.4 bars. Comparing these results with the stress drops of the foreshocks and the main shocks of the Hsin-feng-chiang (1962) and Hai-ch'eng (1975) earthquakes, we note the fact that the small earthquakes in the Ch'iao-chia region are similar to the foreshocks of

of these two large shocks in the character of their stress drops, and so it may not be neglected that these small shocks in the Ch'iao-chia region are foreshocks prior to a larger earthquake. Taking the mean value (about 1.4 bars) of the stress drops of the small earthquakes as an estimation of the lower limit of the stress drop of this hypothetical earthquake, it may be inferred that, from the empirical relationship between the stress drop and the magnitude of the mainshock, the lower limit of the magnitude of this hypothetical earthquake will be about 5.2.

AUTHOR: CHENG Chih-chen [6774 3112 4176]
CH'I Kuo-ying [7871 0948 5391]
KUO Ya-p'ing [6751 0068 1627]

ORG: CHENG of Institute of Geophysics, Chinese Academy of Sciences; CH'I, KUO of Worker-peasant-foldier Student, University of Science and Technology of China

TITLE: "The Focal Parameters of Microearthquakes in the Chang-chia-k'ou-Huai-jou Region"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] Vol 19 No 3, Jul 76 pp 234-238

TEXT OF ENGLISH ABSTRACT: The present paper is the continuation of two previous ones. The focal parameters of microearthquakes (M_L = 2.0-3.0) recorded in the Chang-chia-k'ou - Huai-jou region have been determined from seismograms. The results are: corner frequencies range from 2-5 Hx; seismic moment varies between (0.5-20) x 10^{19} dyne·cm; stress drops are estimated to be less than one to few bars.

6168
CSO: 4009

PHYSICS

AUTHOR: None

ORG: Institute of Physics, Chinese Academy of Sciences

TITLE: "Dare to Scale the Heights of Controlled Thermonuclear Fusion for the Revolution"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No 4, Aug 76 pp 197-198

ABSTRACT: In contrast to the pre-cultural revolution period, research activities in controlled thermonuclear fusion at the Institute of Physics have accelerated rapidly since 1966. Many new equipment such as the angular contraction device, the laser gun, the plasma focusing device and the annular current generator have been installed. In order to establish an operational experimental facility, members of the Institute tackled a variety of problems in high-voltage engineering, electronic automatic control, ultra-high vacuum technology, high temperature plasma, and mechanical engineering. In addition, they also participated in the design and development of most equipment parts and in the construction of the laboratories. These achievements can only be attributed to the guidance from Chairman Mao and to the cultural revolution which

/Continuation of WU-LI, Vol 5, No 4, Aug 76 pp 197-198/

prevented the spreading of capitalistic and revisionistic thinking.

AUTHOR: None

ORG: Shan-hsi University, Department of Physics

TITLE: "Improvement of the Interference Rejection Capability of Digital Control Device for High-speed Hydraulic Forging Press"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No 4, aug 76 pp 199-201

ABSTRACT: A digital control device for the 630-ton high speed hydraulic forging press has been developed jointly by members of the Physics Department of Shan-hsi University and technicians of the T'ai-yuan Heavy Machinery Plant. Since the device is required to operate in a high interference environment, the following measures have been incorporated in the design to improve its interference rejection capability: 1) addition of integration circuits to pulse generating switches; 2) addition of differential interference rejection circuit to the HTL integrated circuit in accordance with its response speed; 3) the use of isolation gate between the digital display tube and the counter; 4) the use of special circuits to overcome intermediate frequency interference from power supplies. In addition, resistors and capacitors were installed in the counter circuits to eliminate short term random interference and interference caused by distributed capacitance between the lines.

AUTHOR: None

ORG: Institute of Physics, Chinese Academy of Sciences

TITLE: "Gallium Arsenide Laser Diodes Which Are Capable of Continuous Operation Under Room Temperatures"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No 4 Aug 76 pp 202-205

ABSTRACT: Since the cultural revolution, the Institute of Physics has been actively engaged in the research and development of gallium arsenide laser diodes. In particular, a gallium arsenide and gallium-aluminum arsenide ($GaAs-Ga_{1-x}Al_xAs$) double heterojunction laser diode has been developed which has higher output power and is capable of continuous operation under room temperature conditions. In this article, the operating principle of a laser diode is briefly explained. The problems associated with the design of the outer extension system and the manufacturing technique of the laser tube are discussed. The measured spectral density of the laser diode at 20°C under an operating current of 215 mA and a threshold current of 207 mA are also presented.

AUTHOR: None

ORG: Kuangtung Province, Hua County, "May 7th" Middle School

TITLE: "Application of the Method of 'Ground Electricity' to Predict Earthquakes in Rainy Regions"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No 4 Aug 76 pp 206-209

ABSTRACT: A method of earthquake prediction using measurements of ground electricity has been developed by members of the "May 7th" Middle School. The method consists of inerting treated lead and carbon electrodes into water fields to a depth of 3 meters, and measuring the electric current between the electrodes. Empirical procedures have been developed to detect abnormal behavior, and to estimate the intensity, time of occurence, and the direction of earth-quake. The procedure was applied successfully in predicting 14 earthquakes during the period from August 1974 to October 1975. Numerical data of four earthquakes during that period are presented to illustrate the procedure: 1) an earthquake in the South Sea on September 3, 1974; 2) an earthquake in Taiwan on July 20, 1975; 3) an earthquake at Ho-yuan on August 16, 1974, and 4) an earthquake at Ho-yuan on July 24, 1975.

AUTHOR: HSU Hao-min /1776/1170/3046/

ORG: None

TITLE: "Ground Light in the Earthquake of Haicheng"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No 4 Aug 76 pp 210-213

ABSTRACT: Ground light is a phenomenon which usually accompanies a strong earthquake. During the Haicheng earthquake on Feb 4, 1975, many sightings of ground light were reported. Ground light has been observed in the form of sheets, lines, columns, fire balls, as well as flashes from cracks in the ground and from wells. Several incidents of skin burns and bodily injuries were also reported during the Haicheng earthquake. There are several hypotheses for explaining the causes of ground light: 1) the voltage hypothesis of Finkelstein and Powell, which suggests that ground light is caused by strong electric field generated by low frequency shock waves via the piezo-electric effect; 2) the hypothesis of electric current generation via ground water motion; 3) the hypothesis of changes in rock resistivity due to rapid variations in stresses. In addition, the author proposes that ground light is primarily caused by the intensification of atmospheric electric field due to the surfacing of radioactive materials and ionized gases.

AUTHOR: None

ORG: T'ientsin Bureau of Textile Industries

TITLE: "An Experiment of Mixing Fuel Oil With Water Using Ultrasonic Waves"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No 4 Aug 76 pp 214-220

ABSTRACT: Recent research shows that blending fuel oil with water increases its efficiency, reduces pollution, and improves safety. In this article, the composition of blended oil is described; some test results of the physical properties and stability of blended fuel oil are presented, and a method of inspecting the quality of blended oil is described. Three different processes of producing blended fuel oil are also described, which include the use of an oil and water mixing tube, the process of mechanical stirring and the ultrasonic blending process. In addition, test results on the combustion process of water blended fuel oil are discussed. Specifically, the performance of blended and unblended fuel oil in many combustion tests are compared; the effects of the quality of blending and the proportion of water content on the combustion process are described. In conclusion, it is pointed out that regular maintenance and improved operation of the furnace are essential to achieve maximum efficiency of using blended fuel oil.

AUTHOR: None

ORG: Shanhsi Teacher's College, Institute of Applied Acoustics

TITLE: "Treatment of Seeds of Wheat and Medicinal Herbs with Ultrasonic aves"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No 4 Aug 76 pp 220-222

ABSTRACT: Ultrasonic waves have been applied successfully to stimulate the growth of wheat crops and two medicinal herbs, the chung-lo and the chieh-keng. In the case of wheat seeds, the best results are obtained by applying a 250-watt, 20 kHz power source for a period of 20 minutes. The treatment increases the rate of germination and the average production per acre by ~ 8.5%. The treatment of herbs reduces the period of germination by as much as 20 months and increases the rate of germination by one to two times. However, the mechanism of biological transformation caused by the ultrasonic treatment is not completely understood at the present time.

AUTHOR: WEI Tseng-chuan [5898/1073/3123]

ORG: Institute of Modern Physics, Chinese Academy of Sciences

TITLE: "On Controlled Nuclear Fusion"

SOURCE: Peking WU-LI [PHYSICS] Vol 5, No 4 Aug 76 pp 226-230 & 225

ABSTRACT: Controlled nuclear fusion is a technology under intensive research because it potentially may provide an important energy source for the future. The basic mechanism of fusion reaction involves the combination of two light nuclei (e.g., hydrogen) into a heavy nuclei and a proton or neutron, while releasing a large amount of energy. In order for fusion to take place, the reacting gas must be heated to an ionized plasma with temperature of 50 to 100 million degrees K, and the heat energy must be maintained for a sufficiently long period to satisfy the so-called Lawson criterion. Currently, the main research topics are concentrated in the heating of plasmas to extremely high temperatures and in restraining the plasma to maintain a stable temperature. The generation of nuclear energy by the fusion process has definite advantages over the nuclear fission process: 1) abundance of nuclear fuel, deuterium, which can be extracted from water; 2) high degree of safety; 3) absence of radioactive by products and the problem of waste treatment; and 4) low cost energy source.

AUTHOR: LI Pen-yuan [2621/2609/3293]

ORG: None

TITLE: "Scale Prevention Using Magnetized Water"

SOURCE: Peking WU-LI [PHYSICS] Vol 5, No 4 Aug 76 pp 240-245

ABSTRACT: The magnetic treatment of water is known to be an effective means for preventing the formation of scales in many industrial applications. In this article, the author presents a tutorial discussion of the magnetization of water. Specifically, the following topics are discussed: 1) the molecular structure of water and the hydrogen bond; 2) the destruction of the hydrogen bond by magnetization and the change in the physical properties of magnetized water; 3) changes in the equilibrium of electrolyte and the formation of $CaCO_3$ due to magnetization; 4) changes in the di-electric constant of magnetized water; 5) the crystal structure of $CaCO_3$ extracted from magnetized water; and 6) the fallacy of applying the principle of Lorentz force to explain the phenomenon of scale prevention using magnetized water and experimental contradiction to the hypothesis that scale prevention is proportional to the intensity of the magnetic field.

AUTHOR: None

ORG: Shangtung Metallurgical School Pilot Plant

TITLE: "Preliminary Investigations of the Principles of Scale Prevention Using a Water Magnetizer"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No4, Aug 76 pp 245-248

ABSTRACT: This article attempts to analyze the mechanisms of scale prevention in magnetized water. The analysis is based on the following clues: 1) difference in the form of crystallization and the form of hydration between magnetized and unmagnetized water; 2) the forces of the magnetic field on water molecules and ions in water; 3) changes in the form of crystallization and form of hydration of the scales due to magnetic treatment; 4) changes in the conductivity, density, surface tension and di-electric constant of water after magnetization.

AUTHORS: WANG Shih-ch'ing [3076/0013/3237
KO Hsu-ch'u 5514/2485/0443
LU Chu-fu 4151/3515/3940
CH'EN Fang-p'ei 7115/2455/1014
MENG Kuang-ta 1322/1684/6671
YANG Tsai-shih et. al 2799/0375/4258]

ORG: None

TITLE: "See Text"

SOURCE: Peking WU-LI /PHYSICS/ Vol 5, No 4 Aug 76 pp 249-256

ABSTRACT: The controversial subject concerning the basic concept of mass, inertia, and energy are discussed in a series of articles from the view points of both physics and philosophy. The articles cover the following specific topics: 1) the feasibility of interpreting mass as a measure of "quantity of matter", which includes the measure of inertia as a special case; 2) the generalization of the law of conservation of mass into the law of conservation and transformation of mass; 3) the non-existence of a unified concept of "quantity of matter" and the restricted interpretation of the laws of conservation of mass and conservation of energy: 4) the concept of changeability of mass and energy and the compatibility between this concept and the

/Continuation of WU-LI Vol 5, No 4 Aug 76 pp 249-256/

non-destructability of matter and motion; and 5) different view points of interpreting the mass-energy relations $E = mc^2$.

3012
CSO: 4009

GEOGRAPHICAL KNOWLEDGE

AUTHOR: CHOU CHAO-JUI [0719 0340 6904]

ORG: None

TITLE: "Wuhan -- on March"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 pp 1-3

ABSTRACT: Wuhan Municipality is on a plain in the middle Yangtze River; the municipality is made up of Wu-ch'ang, Hankow and Han-yang linked with the Yangtze and Han River bridges. Since the Liberation, Wuhan has been the scene of key reconstruction projects. Total industrial output in 1975 rose by 49-fold over 1949 and the proportion of heavy industry output went up to 53.7 percent in 1975 from 5.8 percent in 1949. This is a manufacturing center of iron and steel as well as machine goods. The output of Hupeh Diesel Engine Plant, Wuhan Diesel Engine Plant, Wuhan Tractor Plant and Wuhan Water Pump Plant climbed by 10 to 20-fold over the pre-Cultural Revolution levels. At highwater 10,000-ton steamships can reach Wuhan and 8000-ton steamships -- I-ch'ang. The Ying-wu-chou and Ch'ing-shan wharves were built and

[continuation of TI-LI CHIH-SHIH No 8, Aug 76 pp 1-3]

loading and unloading have been more than 80 percent mechanized. Included is a map of Wuhan.

AUTHOR: HSIAO WEI [5135 1792]

ORG: None

TITLE: "Inside and Outside Chia-yu-kuan [a pass]"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 pp 4-7

ABSTRACT: The Great Wall terminates at Chia-yu-kuan in the Ho-hsi Corridor, a narrow strip of lowland bounded in the north by Ch'i-lien and A-erh-chin mountains and in the south by Lung-shou--Ho-li--Ma-tsung mountains. The corridor is over 1200 km long and about 100 km wide. Glaciers and snow packs in the southern mountains feed irrigation water for the lowland corridor; total water storage is tens of billions of cubic meters. The irrigated areas are oases, about 5 percent of the land and surrounded by sand or pebble deserts. The main crops are spring and winter wheat, sugar beet and maize with a mou unit yield of 478 chin of grain in 1975 in Wu-wei area. Minorities living in the corridor and mountain meadows are Mongolians, Tibetans and Yu-ku herdsmen. On an average, the Yu-ku has more than 40 domestic animals per capita. Included are one map and five diagrams.

AUTHOR: None

ORG: Department of Geography, Peking Normal College

TITLE: "Groundwater in Plain Areas"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 p 7

ABSTRACT: Groundwater is water lying underground in fissures or caves. Groundwater slowly moves from shallow to deep locations. Clay or subclay layers with low permeability can confine groundwater from below. Groundwater can be divided into shallow-depth stagnant water, shallow groundwater and inter-layer groundwater. If groundwater is under a head, water will automatically rise and become a geyser through a drillhole. This is called artesian water. If the lower confining layer is penetrated, the water level will drop. When the groundwater has abundant sources and desirable storage conditions, it can serve in irrigation or recharging storage. Included is a diagram showing different types of groundwater.

AUTHOR: None

ORG: Correspondence Section, Ch'uan-chiao County Revolutionary Committee

TITLE: "Progress in Hilly Ch'uan-chiao County"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 pp 8-10

ABSTRACT: Ch'uan-chiao County is an advanced area in Anhwei Province in profiting from Ta-chai's agricultural experiences. In 1974 the grain, cotton and hogs output of the county exceeded the quota prescribed for the Yangtze River valley. The article describes a main project, the Szu-ma Hill Canal, linking the Yangtze River for irrigation and drainage. The project includes 3.8 million cubic meters of earthwork and rubble masonry, built by 50,000 peasants over two years in the slack agricultural seasons of winter and spring. Tea orchards and fruit trees (pears, apples, grapes and peaches) were planted on the hilly slopes. In addition, fish culture and water plants were developed. Included is a map showing the area.

AUTHOR: SUN HUA-YANG [1327 5478 7122]

ORG: None

TITLE: "Three Yangtze Gorges: Orange Tree Country"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 p 10

ABSTRACT: The three Yangtze gorges area has been orange tree country since the T'ang Dynasty, as the northern mountains shielding the gorges from cold winds. However, orange cultivation was neglected before the Liberation. The article lists famous orange varieties -- well-known for thin skin, high sugar content, delicious flavor and fresh appearance. The yield per tree is as high as 1300 chin of oranges with 11 percent sugar content or higher. In the harvesting season from late autumn to early winter, a flurry of activities can be seen from steamships on the river. In a single county, Tzu-kuei of Hupeh Province, there are 1.2 million orange trees on 42,000 mou of orchards. This is an increase of 32-fold in plantation area compared to the cultivation at Liberation time.

AUTHOR: None

ORG: Ho-ch'u County Revolutionary Committee

TITLE: "Experiences From Managing and Planning of Capital Construction of Farmland"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 pp 11-12

ABSTRACT: This article reflects more than 20 years' work in farmland capital construction. To take one measure, of some 2400 dams built in the county over the years, only 1800 dams remain; the rest (some 600) collapsed under water erosion. This accounts for the lack of longterm and overall planning. Besides Party rhetoric, the article stresses cooperation among the leadership, technicians and masses as well as attention to local conditions in tailoring solutions to locales.

AUTHOR: SO WEN-CH'ING [4792 2429 3237]

ORG: None

TITLE: "Tengs Today"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 p 13

ABSTRACT: The Tengs are a minority living in the Ch'a-yu Valley along the Tsangpo River in Tibet. They number only about 180 households. The valley is well-known as Tibet's lowland, enjoying a mild subtropical climate. Before the Tibetan democratic reform [i.e., after Dalai Lama's flight to India in 1959], the Tengs were treated as primitive aborigines by Tibetans and lived in deep forests. However, since 1959 Tengs have resided in the river valley and more than 1000 mou of farmland has been reclaimed. Terraces were constructed and tea and fruit orchards cultivated. Today the Tengs have surplus grain output and electric lighting and a wired broadcasting system covering the five Teng production teams. Local barefoot doctors provide medical services.

AUTHOR: CH'EN LU-YUEH [7115 0712 1471]

ORG: None

TITLE: "Ta-ning River, a Corridor Between Steep Gorges"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 p 14

ABSTRACT: Ta-ning River empties into the Yangtze River at Wu Gorge in Szechwan Province. The river flows through Wu-ch'i and Wu-shan counties with a total length of over 200 km. There are thousands of shoals and rapids throughout its extent with an elevation drop of over 300 meters. At highwater the river flow is as much as more than 5000 cubic meters per second but the low-water period in winter the per-second flow is only a scant few cubic meters. This hinders navigation. After the Liberation, the river channel was regulated and shoals and rapids removed by dynamiting. Soil erosion was prevented on steep mountain slopes at both banks. By now, motorized boats can navigate 165 km of the river all year long. A photograph shows motorized boats in navigation.

AUTHOR: None

ORG: None

TITLE: "Improving Agricultural Machinery Through Self-Reliance"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 p 14

ABSTRACT: This article describes advances in agricultural machinery in the Chefoo area of Shantung Province. In recent years, small tractors, diesel engines and various agricultural implements were produced. The total rise in horsepower capacity of agricultural machinery of the Chefoo area from 1971 to 1974 exceeded the total increase of the ten years just prior to the Great Cultural Revolution. Grain output thus rose steadily; the 1975 grain output averaged 800 chin per mou, the highest ever. Small iron and steel integrated industry was established and more than 130 small factories organized in making farm implements. A photograph shows Lai-yang Tractor Plant with an annual output of more than 2000 20-hp tractors.

AUTHOR: None

ORG: Hydrology Section, Hopeh Provincial Institute of Geography

TITLE: "Three Questions and Answers About Artificial Recharging of Groundwater"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 8, Aug 76 pp 30-31

ABSTRACT: There are three questions and answers. The first question is "What Is Recharging?" Recharging of groundwater stores surplus water from time to time in underground water storage zones to maintain a steady groundwater level for irrigation. The second question is "Why Recharge?" In the plain areas of Hopeh, Honan and Shantung, at times in spring and summer there is low rainfall and in the monsoon season from July through September, too much rainfall often brings flooding. So artificial recharging of groundwater is vital during the monsoon season to permit irrigation in droughts. The third question is "How Can Recharging Be Done?" Water storage facilities on the ground surface such as ponds, lakes and rivers can hold water temporarily. Then water gradually percolates downward. Flood irrigation of farmland and artificial filling of wells and underground

[continuation of TI-LI CHIH-SHIH No 8, Aug 76 pp 30-31]

zones can also help recharge groundwater.

END

10424
CSO: 4009