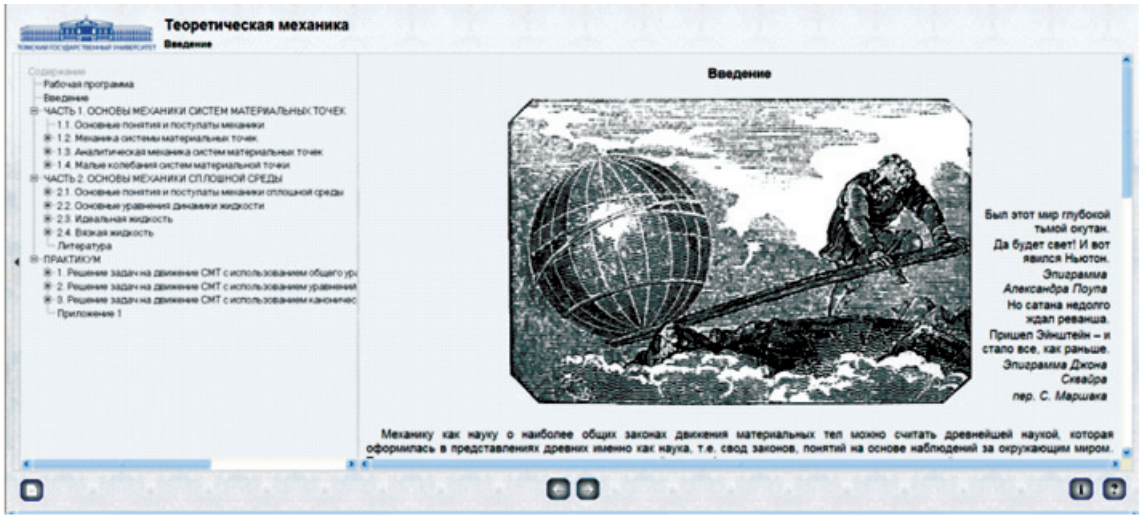
ISSN - 1996-3947

Международный журнал экспериментального образования

№ 5 2013

сания механики (векторной и вариационной), вначале рассматриваются основные теоремы динамики систем материальных точек в декартовой системе отсчета и их связь со свойствами пространства и времени, а уже затем происходит переход к пространству обобщенных координат и фазовому пространству. Рассмотрение малых колебаний систем материальных точек приводит к электромеханическим аналогиям, в частности, к рассмотрению колебаний в электрических цепях и к уравнениям Лагранжа-Максвелла.



Во второй части на основе эйлерова и лагранжева подходов к описанию движения сплошной среды рассматриваются основные уравнения динамики жидкости – как в дивергентной, так и в недивергентной форме, и анализируются несколько широко используемых моделей сплошной среды: идеальная жидкость, вязкая ньютоновская жидкость. Также рассматриваются критерии гидродинамического и теплового подобия, свойства и полуэмпирические модели турбулентности.

В практикуме приведены методики решения задач механики систем материальных точек с применением общего уравнения механики, уравнений Лагранжа 2-го рода и канонических уравнений Гамильтона. Алгоритмы решения задач иллюстрируются на примерах. В каждой теме содержатся задания для самостоятельной работы. В банке контрольно-измерительных материалов содержится более 100 тестовых заданий по всем разделам учебно-методического комплекса.

ЭУМК имеет регистрационное свидетельство обязательного федерального экземпляра электронного издания № 29297 (гос. рег. № 0321204529 от 28.12 2012, ФГУП НТЦ «Информрегистр»).

HIGHLIGHTS IN HELIOCLIMATOLOGY: COSMOPHYSICAL INFLUENCES ON CLIMATE AND HURRICANES

Peraza Jorge Perez, Libin I.

Институт геофизики Национального автономного университета Мексики (ИГ УНАМ);
НОУ ВПО «Международная Академия оценки и консалтинга» (МАОК), Москва, e-mail: libin@bk.ru

The problem of a possible relationship between the seasonal and the long period variations of different atmospheric, hydrologic and geophysical processes with heliophysical and cosmophysical processes has been discussed very often in the literature. Since 1937 L. Chijzhevsky had argued about the primordial role of the sun within the group of phenomena and mechanisms which are now known as the field of Solar-Terrestrial relationships. However, for the first time this topic was discussed famous physicists of the world in 1927 at the Solvay Conference.

The problem of possible relationships of the seasonal and many-year variations in the Earth's atmosphere to various heliophysical and cosmophysical events was raised repeatedly elsewhere, including, at the time of the Soviet scientific expedition on the ship «Griboyedov», which was attended by the future Nobel Prize winner Vitaly Ginzburg.

The fact that the processes occurring on the Sun are responsible for various atmospheric disturbances has proved to be undoubted in 1985. The atmospheric circulation is affected by the cyclicity of varying solar activity which controls not only the geomagnetic activity state, but also the temporal variations of the intensity of galactic and solar cosmic rays. So, a complex relationship among all the above mentioned events is reasonable to expect. The parameters of each of the events exhibit their own spectrum of seasonal and many-year variations because, despite their common mechanisms, a fraction of the observed variations are characterized by different casual relationships. The aim of the present work is to seek for unstable and quasistable frequency-dependent correlations among various cosmoheliophysical and meteorological processes and to make an attempt to simulate these processes mathematically.

Solvay Conference, 1927

Soviet scientific expedition on the ship «Griboyedov»

The fact that the processes occurring on the Sun are responsible for various atmospheric disturbances has proved to be undoubted in 1985 (Igor Libin and Jorge Perez Peraza). The atmospheric circulation is affected by the cyclicity of varying solar activity which controls not only the geomagnetic activity state, but also the temporal variations of the intensity of galactic and solar cosmic rays. So, a complex relationship among all the above mentioned events is reasonable to expect. The parameters of each of the events exhibit their own spectrum of seasonal and many-year variations because, despite their common mechanisms, a fraction of the observed variations are characterized by different casual relationships. The aim of the present work is to seek for unstable and quasistable frequency-dependent correlations among various cosmoheliophysical and meteorological processes and to make an attempt to simulate these processes mathematically.

During tens of years the majority of mass media in the whole world are making gloomy oracles. We know from them that the humanity has very few years left to live. Greenhouse effect together with

ozone holes and global warming will annihilate the humanity and the Earth as well. And it is the man or, it is better to say, his technological activity which is guilty in the future tragedy. All these nightmares have led to formation of very authoritative and aggressive political powers in many countries. They are various ecological and green movements which have already become parties, in some places even dominant ones, or, at least, included to the dominant coalition. But damages caused to the world economy by extreme weather phenomena – floods, hurricanes, earthquakes, etc. – have risen from 10 to 150 billions of dollars a year for the last fifty years (but in absolute expression). Natural disasters become more and more scaled, and scientists connect the growth of a number of them with climatic variations. And it is another question if they are man-made ones or not. In addition, about thirty years ago ideas about the dominant influence of human activity on the climate appeared, and it brought to formation of the main international phenomenon called Kyoto Protocol.

Not only scientists have understood that the problem of changing climate is really important for the humanity to survive. In 1992 representatives of the world community decided to begin practical actions during the famous meeting in Rio-de-Janeiro. The UN Framework Convention on climate change became an outcome of this meeting. The Convention came into force in 1994, and 186 countries set their hand on it. In 1997 the Kyoto Protocol to the Convention where numerical obligations to reduce emissions were prescribed was signed in Kyoto (Japan). The Kyoto Protocol is the first stage of global ecological agreement on prevention disastrous climatic fluctuations. The main thing in the protocol is quantitative obligations of developed countries and countries with economy in transition including Russia to limit and reduce emission of greenhouse gases to atmosphere in 2008-2012. That time ten years ago a decision to form a many-mullioned fond for fighting with global warming – or with industrial and everyday emission of carbon dioxide – was taken in the OPEC conference in Riyadh (Saudi Arabia).

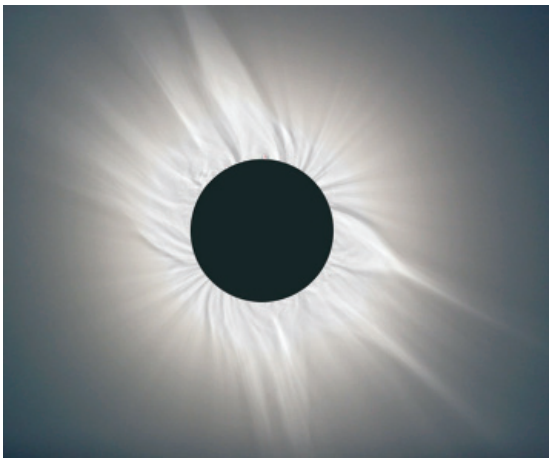
John Coleman, an American scientist, a founder of The Weather Channel, says that the global warming on the planet connected with human anthropogenic activity is a fiction invented by politicians, scientists and businessmen exploiting it pro domo sua. I.Y. Libin, an author of this book, writes in one of his works, «It means that in case of sighing the Kyoto Protocol we have no possibilities for a free of charge growth of our economy (for those who does not know that the year 1990 was a failed one in the Russian economy). All said above does not mean that it is necessary to refuse from the Kyoto Protocol sharply, like the USA. As one of the politicians said, «War is a very serious thing to trust it to military men». Not separate representatives of meteorology incorporated to the power and not officials should decide about the future participation of Russia in the Kyoto Protocol, but a wide scientific society. The decision to be or not to be in the Kyoto Protocol for Russia should be taken after wide open discussions by specialists in climatic sphere and economists.

Global change of the climate is a problem of a planetary scale, and the whole world will have to settle it. Making a coordinated decision is as necessary and unavoidable as a common fight with terrorism. And the earlier politicians begin real actions, the less damage will be». But we would like to understand if the man is really such a self-killer, that he tries to kill himself and every living thing on the planet so passionately? Since the first minute of it's comparatively intelligent existence the humanity has always made damage to the planet to survive. And it (the humanity) has not had any other way to continue its existence on the Earth. All natural forces and other types of animals have always been stronger then a Homo sapiens.

Skeptics say that technologies harmful for nature have been developed especially quickly during last decades after an industrial revolution. But nature-conservative measures have gained up momentum as well. A common sense prompts, that the existence of the humanity is connected directly with development of modern technologies. Or it will not support itself. But what about invocations of a future disaster in mass media? We often listen to a forecast of helio (solar) and geomagnetic activity for the nearest days on the radio and television and read it in newspapers and nobody thinks about that great work (of many research teams) which stands for these forecasts. All of us have become consumers of forecasts, got used to their existence and do not think about their importance for our life. But except common people lending their ear to all these forecasts and planning their behavior for the nearest days, EMERCOM specialists, operators, cosmonauts and military men, meteorologists and biologists, doctors and hydrologists in our country and abroad are also consumers of these forecasts.

Galina Mashnich, a wonderful scientist, writes, «For successful forecast of the Earth's future climate it is necessary to come from a deadlock conception of geocentricism to a conception of heliocentricism in studying climate of our planet. It is necessary to understand that the Earth's climate is a natural component, prolongation of cosmic climate…». But all forecasts are impossible without a fundamental science where the whole building of applied research is built on. We can say the same about the science. It seems to me that today it has become a part of the world economy, because it makes it possible to value and make approximate forecasts of expected non-anthropogenic disasters, such as earthquakes, droughts, epidemics, weather cataclysms, frequency of hurricanes. It explains in-

fluence of solar activity variations on processes occurring on the Earth and in the closest cosmic space. Nobody has abolished competition in the scientific society, but the price which the scientists are standing before today is very high – normal existence of the humanity in the nearest future. That is why, scientists` practicalness and a wish to get the results as soon as possible overpowers normal individual ambitions.



Sun – the source of climate change

Worldwide globalization which is widely discussed in the world but not always with respect unites not only finances and observation data today; it unites different researchers` creative multinational power. And as a result, multiethnic groups have made much more during the last years then during two decades of previous research. A.L. Chijzhevsky, an outstanding Russian scientist wrote, «In what way do roughness and storms occurring on the Sun influence the planet? Is our spacecraft «Earth» still sailing calmly and quietly or it is being rocked on the waves of solar cycles so much that time to time one can hear clatter of glasses in the cabin?».

In this book we have tried not only to generate the results of influence of solar activity on the Earth's climate (including our own ones) got with a lot of research but also to estimate what hazard do global climatic variations bring the humanity.

УЧЕБНО-МЕТОДИЧЕСКОЕ ПОСОБИЕ ПО ИНФОРМАТИКЕ

Покрышкина О.В., Полякова Я.О.

ГАОУ СПО СО «Нижнетагильский государственный профессиональный колледж им. Н.А. Демидова», Нижний Тагил, e-mail: pokrov05@list.ru

В условиях быстрого развития процесса информатизации всего общества сам процесс изучения информатики должен стать в большей степени практико-ориентированным и требует от современного студента большей степени самостоятельности в изучении дисциплины, что определяет актуальность использования предлагаемого учебно-методического пособия.

В соответствии с Федеральным государственным образовательным стандартом (ФГОС) по специальности 190631 «Техническое обслуживание и ремонт автомобильного транспорта» приоритетными объектами изучения дисциплины «Информатика» выступают основные понятия автоматизированной обработки информации, базовые системы, программные продукты и пакеты прикладных программ, и их использование в повседневной жизни и будущей профессиональной деятельности студентов.

В связи с этим, а также для повышения уровня познавательной мотивации студентов, последовательность изучения материала построена таким образом, чтобы как можно раньше начать применение широкого спектра прикладных программных средств и систем автоматизированной обработки информации для решения профессиональных задач.

В учебно-методическом пособии представлено основное содержание дисциплины с распределением учебных часов по разделам курса и требованиями к уровню знаний и умений, а так же степени сформированности общих и профессиональных компетенций техника по специальности 190631 «Техническое обслуживание и ремонт автомобильного транспорта». Пособие содержит теоретический материал, изложенный в форме опорных конспектов, практические работы с рекомендациями по их выполнению, перечень вопросов и заданий для самостоятельной внеаудиторной работы студентов.

Использование данного учебно-методического пособия предполагает модель организации учебного процесса, где в качестве цели обучения выступает совокупность профессиональных компетенций обучающегося, в качестве средства ее достижения – модульное построение структуры и содержания профессионального обучения.

Кроме этого, при самостоятельном выполнении практических работ предполагается актуализация и использование студентами информации не только из курса информатики, но и из других предметных областей.

Вышеизложенные особенности и определяют новизну предлагаемого учебно-методического пособия.

Настоящее пособие может быть использовано для самостоятельного изучения студентами курса информатики, закрепления пройденного материала в объеме, предусмотренном ФГОС среднего профессионального образования, что при необходимости позволяет спроектировать и реализовать индивидуальную образовательную траекторию обучающегося.