

Milan Radovanovic*, Vesna Lukic*, Nedeljko Todorovic**

HELIOCENTRIC ELECTROMAGNETIC LONG-TERM WEATHER FORECAST AND ITS APPLICABLE SIGNIFICANCE

Abstract: Heliocentric electromagnetic long-term weather forecast represents new methodological approach in studying of weather development. Accomplished results can have exceptional significance for needs of tourism and many other activities. Furthermore, since forecasts made for Belgrade can be tested to any place in the world which has daily meteorological measurements. For example, for all tourist manifestations, which are held in the open, application of this method can be of priceless value from economic, i.e. managerial aspect. Every further advancement of the used method in the context of modelling, as well as its practical use in any way, can give significant movement in the area of organizational needs. Contrary to former "classic" long-term weather forecasts (models), which have smaller and smaller reliable possibility with increasing of weather factor to which they are related to, in starting phase it was shown that heliocentric electromagnetic long-term weather forecast has relatively high degree of precision also in the third month.

Regarding rainfalls, former electromagnetic long-term forecasts were also characterized by, conditionally said, partial success. Yet it seems that unrealizations that had occurred can not decrease the significance of applied methods. On the contrary, they only confirm correctness of the basic assumptions, furthermore since moments on which one has to pay special attention have been recognized, in order to achieve even more precise results in the future forecasts. This paper analyzed two cases of long-term forecasts based on heliocentric electromagnetic approach.

Key words: long-term weather forecast, heliocentric electromagnetic method

Introduction

In the last couple of years there have been abundance of papers, which deal with influence of Sun to certain meteorological, i.e. climate elements from different aspects. In certain number of cases, that connection had been, conditionally

* Milan Radovanovic, Geographical Institute "Jovan Cvijić" Serbian Academy of Sciences and Art, gijcsanu@eunet.yu

Vesna Lukic, Geographical Institute "Jovan Cvijić" Serbian Academy of Sciences and Art, gijcsanu@eunet.yu

**Nedeljko Todorovic, Hydrometeorological Bureau of Serbia, todor52@yahoo.com

speaking, direct, but on the other hand not rarely happened as if causality hadn't even occurred. "There has been more controversy about other parameters such as the open solar flux from the Sun, the geomagnetic *aa* index and the galactic cosmic ray (GCR) flux, which varies inversely with solar activity" (Kristjansson et al, 2004). Habbal, Woo (2004) believe that: "The combination of solar wind dynamic pressure and magnetic reconnection leads to the formation of the tear-drop shaped magnetosphere, and the entry of solar energetic particles into the Earth's ionosphere". Landscheidt (2000) also thought in similar way: "The strongest contributors to the solar wind intensity are energetic solar eruptions (coronal mass ejections, flares, and eruptive prominences) which create the highest velocities in the solar wind and shock waves that compress and intensify magnetic fields in the solar wind plasma. Coronal holes have a similar effect. So it suggests itself to investigate whether periods of strong plasma ejections on the Sun are connected with temperature on Earth. Not all strong eruptions have an impact on the near - Earth environment. The effect at Earth depends on the heliographic position of the eruptions and conditions in interplanetary space. Indices of geomagnetic disturbances measure the response to those eruptions that actually affect the Earth". According to Palamara, Bryant (2004) none asks the question whether there is inter-active connection. "The crucial question now relates to how solar/geomagnetic activity is coupled to the lower atmosphere".

"Classic" researches that had been conducted so far, if one can say, "felt" the connection between activities on Sun and development of synoptic situation on Earth. Researches of many authors, according to Menzel (1963) point out that Sun activity, established by geomagnetic disturbances, is closely connected to many weather changes on whole Earth surface. Corbyn (2004) says that: "Traditional forecasts can only go up ten days ahead for any meaningful forecast whereas the Solar Weather Technique can give detailed forecasts of extreme weather many months ahead. It is proven to be especially accurate for cold snaps and storms. Traditional forecasters believe that the Earth's weather is primarily controlled by weather in the past, which is not true; there are external influences that come from the Sun, and are predictable".

Persistent search through literature has convinced us that there are numerous and serious studies, which results are not in accordance with general opinion both in science as well as in the media. The thoughts, first of all, are aimed at context of generally adopted methods, which have been officially used to make long-term forecasts. Landscheidt (2003) gives detailed list of papers which work on interactive relation Sun-atmospheric processes: "Yet there are hundreds of observations which show that within a few days after energetic solar eruptions (flares, coronal mass ejections, and eruptive prominences) there are diverse

meteorological responses of considerable strength (Balachandran et al., 1999; Bossolasco et al., 1973; Bucha, 1983; Cliver et al., 1998; Egorova et al., 2000; Haigh, 1996; Herman and Goldberg, 1978; Landscheidt, 1983-2003; Lockwood et al., 1999; Neubauer, 1983; Markson and Muir, 1980; Palle Bago and Butler, 2000; Prohaska and Willett, 1983; Reiter, 1983; Scherhag, 1952; Schuurmans, 1979; Shindell et al., 1999; Sykora et al., 2000; Yu, 2002)".

Short excerpt from researches conducted so far

Mukherjee (2006) has shown that there is connection between processes on the Sun and certain climate, i.e. meteorological elements. "It may be noted that the sudden snowfall on the northern hemisphere continents on the 25th of December, 2004 has sufficient bearing on Star-Sun-Earth's atmosphere interaction". Justification of these approaches is based on numerous measurements of recent date, which give quantitative parameters of Sun's wind (SW), as well as other processes within inter-planetary area. "The Sun's changing magnetism has several consequences, some only recently learned. For example, the surprise of the last 20 years is the observed fact that the total light, or brightness, of the Sun also changes in step with the magnetic cycle" (Baliunas, Soon, 2000).

If there are already strong indications (based on numerous researches) which are related to connection of radiation of Sun or cosmos with the occurrence of cloudiness, we can justly ask the question whether it means that rainfalls are determined by outer influences? Justification of such „heretic“ question is based on a fact, which shouldn't be the matter of dispute, that rainfalls can only occur from the clouds. In that sense, paper written by Bhattacharyya, Narasimha (2005) was shocking. "Using wavelet techniques it is also found that the power in the 8-16 y band during the period of higher solar activity is higher in 6 of the 7 rainfall time series, at confidence levels exceeding 99.99%. These results support existence of connections between Indian rainfall and solar activity".

Studying storms in Britain, Wheeler (2001) had relied on general aspects of the procedure used by Corbyn. Those aspects are based on variations in the Sun behaviour, its magnetic field, coronal eruptions and fluctuating character of SW. Therefore, it was about methodology that doesn't have almost anything in common with the majority of contemporary forecast models in use. The result was that 4 out of 5 strong storms had been correctly predicted in the period October 1995 – September 1997. The fifth one had the mistake of 48 hours, which can be considered as marginal (viewed from the aspect of the developing methods), simply because the forecast had been done months earlier. As far as

we know, the above mentioned Corbyn hadn't published his methods, because they were used in commercial purposes.

In that context, we find more material about work out of forecast models with following author: "I have shown that ENSO events, the North Atlantic Oscillation (NAO), the Pacific Decadal Oscillation (PDO), extrema in global temperature anomalies, drought in Africa, and European floods are linked to cycles in the sun's orbital motion around the center of mass of the solar system. So the next extended wet period should begin around 2007 and last about 7 to 8 years ...A draught peak, indicated by LPTC ...is to be expected from 2025 on and should last about five years" (Landscheidt, 2003). The same source gives the proof that forecast had been made several years in advance: "Dr Theodor Landscheidt claimed several times in the above paper that he had successfully predicted key climatic events (such as the current El Niño) years before the actual events, making reference to papers currently archived on this website and to other papers he has published elsewhere. I can certify that the papers he refers to were indeed published on this site on the dates indicated and that his forward predictions made on this website to events that have now already happened were indeed made well ahead of their time, just as he says they were. In particular, he predicted the current El Niño 3½ years in advance, in a paper published on this website in January 1999. I can therefore fully confirm the authenticity of that prediction, as can the many expert reviewers who participated in the subsequent open review in 1999¹".

According to Stevancevic's hypothesis (2004, 2006), highly energetic particles which come to us from the Sun, seize the air masses by hydrodynamic pressure (after the breach through magnetosphere) and directly influence the atmospheric processes. If there is humidity saturation at the site of contact with air masses, also depending on characteristics of Sun Wind, not only clouds but also rainfalls can appear. Mechanism of rainfall appearing is explained by principle of electron valence. So, not only occurrence of cloudiness and rainfalls, but also occurrence of hot waves and dry periods are caused in the first place by electromagnetic characteristics of SW, Sun location from which it is ejected and its chemical structure. Atmospheric processes and the locations of their occurrence would depend on these parameters. The key that explains the above mentioned causal relations, according to the mentioned author, is the circulation of vectors of interplanetary magnetic fields. It is interesting that there are similar considerations regarding the throwing out SW from the Sun. Wang (2005) says:

¹ John L. Daly

“Without the detailed knowledge about the vector magnetic fields in the photosphere, the coronal heating and activity can not be properly understood”.

Review of the used method and the results

Considering the results of the researches conducted so far in the field of synoptic meteorology, it has been assumed, as working hypothesis, that weather on Earth is determined by energy of the white light, energy of corpuscular radiation (SW and Sun Spots), and that synoptic situation on Earth is conditioned in the first place by energy of inter-planetary magnetic fields. In that context, atmospheric processes have been studied from the aspect of object which reacts differently on outer influences. After the first steps, it turned out that it has been necessary to develop new methodology which has multidisciplinary character (Stevancevic, 2004). Theoretic assumption of the working hypothesis not only showed to be justified, but also, according to our assessment, represents new and original scientific base for understanding of weather development. Due to specific above mentioned problems, the only way of conducted researches' checking, was to publish long-term weather forecast in the media. It is well known fact that newspaper articles doesn't represent scientific material, but at the given moment, there was no other way to check his own results. Therefore, after period for which the weather forecast had been made had expired, the approach has been made to compare them to measured data from Meteorological observatory Belgrade.

Due to limiting scope of work, it is impossible to explain in details the way on which one can come to final product, i.e. prognostic calendar. In the attempt to point out his results to broader audience, Stevancevic has shown the basic postulates of his methodology in two monographs (published in 2004 and 2006).

Following, i.e. analysis of energetic regions, one can calculate energy which would be directed towards Earth, time and place of interactive physical-chemical processes in the atmosphere (Stevancevic et al, 2004). The place of SW breach to Earth's atmosphere determines the place of making new synoptic situation, which is further examined by known and relatively reliable methods (Radovanovic et al, 2003 a, Radovanovic et al, 2003 b).

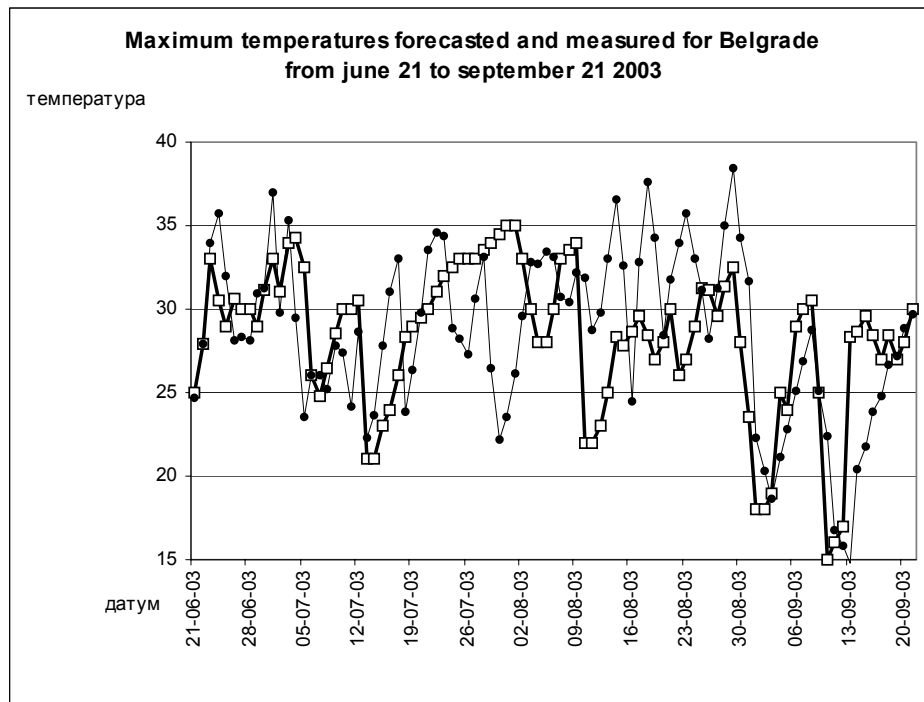


Figure 1. Seasonal forecasted (values connected by full thick line) and measured maximum daily temperatures (values connected by thin line) for period June 21st-September 21st 2003 for Belgrade and surrounding area (published in daily newspaper “Politika” 20. 06. 2003)

Rough follow-up of accomplishing of forecasted temperatures (fig. 1) has shown satisfying result in total (Ducic, Radovanovic, 2005). The best side of seasonal forecast were the accomplishments of dates with significant changes of weather conditions, specially arrival of cold front and breach of cold front, in one number of cases with certain deviation from 1 to 3 days. The worst side was the appearance of several separated, relatively short periods with weather situations opposite to forecasted ones (warm-cold). Analysis of errors and their possible causes has been given in the paper Stevancevic et al, 2006.

Table 1. Average error, average absolute error and coefficient of co-relation between forecasted and measured maximum temperatures for seasonal weather forecast for Belgrade and the surrounding area in summer 2003

Period	Duration	Average Error	Average Absolute Error	Coefficient of Co-relation
Season	21.06.-21.09.	0.28	3.92	0.44
Successful part	67 days (72.1%)	0.00	2.59	0.73
Unsuccessful part	26 days (27.9%)	1.00	7.33	-0.14
1 st period	15.07.-18.07.	3.60	5.80	-0.44
2 nd period	29.07.-01.08.	-10.10	10.05	-0.25
3 rd period	10.08.-19.08.	6.00	6.84	0.29
4 th period	29.08.-01.09-	6.20	6.18	0.97
5 th period	13.09.-16.09.	-8.50	8.50	0.35

For the whole viewed forecasted period (93 days), the average error between forecasted and measured maximum temperatures has been 0.28, and average absolute one 3.92 degrees. Coefficient of co-relation between forecasted and measured maximum temperatures has been 0.44, which points out to weak relation between the two lines. However, if we could conditionally separate the lines into successful part (total of 67 days, average in the most of 67 days absolute error of 2.59 degrees is smaller than the error for the whole line, i.e. smaller than 3.92 degrees), and the unsuccessful part (total of 26 days, four periods of 4 days lasting and one of 10 days, with average absolute error bigger than 3.92 degrees), we would get encouraging result. For the successful part of line, which is consisted of 72.1% of days from forecasted period, the average absolute error considerably decreases and is 2.59 degrees, and coefficient of co-relation is then 0.73, which points out to tight relation of the two lines, i.e. successful forecast. The unsuccessful part, which is consisted of 27.9% days from forecasted period, has the average absolute error 7.33 degrees, and coefficients of co-relation for each period and in total point out to weak or totally weak relation between forecasted and measured temperatures. The exception is the period from August 28th to September 1st, for which it is 0.97 and what tells us that trend of forecasted temperature had been excellently covered by the measured (tab. 1).

Viewed in total, the seasonal forecast of weather has shown satisfactory results. Since method of forecast is in development phase, more successful results can be expected in the future.

The forecast shown on fig. 2. has been done on March 20th, i.e. 10 days before period on which it refers to. Period of 27 days has been studied, i.e. one meteorological month, which length approximately corresponds to differential rotation of the Sun.



Figure 2. Forecast of maximum temperatures (values connected by full thick line) and days with rainfalls (rectangles at the bottom of the graph marked with full line) for period March 30th to April 25th 2005 for Belgrade and the surrounding area. Measured values of maximum temperatures are marked with thin full line, and period with rainfalls with rectangles with broken line

In that period, the main characteristics of the weather situation has been relatively frequent changeability of synoptic situation. At the beginning of period, until April 8th, the weather had been stable under the influence of anticyclone. From April 9th all the way to the end of forecasted period, cyclone circulation had dominated with frequent passes of warm (two cases) and cold (5 cases) fronts and big oscillations in temperature regime. So, during those 17 days, there were 7 atmospheric fronts or approximately one within 2-3 days. That also reflected the accomplishment of forecasted maximum temperature. During first six days the fulfilment had been excellent (coefficient of co-relation 0.89), and then there was period with significant disruptions. Viewing the whole period, coefficient of co-relation between measured and forecasted maximum temperatures is very low (0.12), which strictly statistically

shows that relation between the two lines has been insignificant. The main reason is difference between days and weather changes. Deviations were from 1 to 3 days, which had also caused high average absolute error of 4.36 degrees, although the average error was only 0.31 degrees. Much better accomplishment had been in the view of rainfalls, specially during the first seven days. After that, there was period of very changeable weather and rainfalls were noticed during most of the days for which they had been forecasted.

Accomplishment evaluation of maximum temperatures' forecast by days is unsatisfactory, apart from the beginning of the period, but viewed over basic characteristics of weather (dry period, changeable period, frequent warmings and cold spells, rainfall days), it was good. Viewed in total, this example can also say that evaluation of the forecast has been satisfactory and that it might be of practical use.

Significance of development of electromagnetic long-term weather forecast for practical needs

Numerous activities of population, economic and social ones, are multiply depending on meteorological situation. Out of multitude of specific needs for exact and long-term weather forecasts, these can be singled out: applying of weather forecast for the needs of protection of population's health, agriculture, tourism and protection from extraordinary and dangerous meteorological phenomena.

From the ancient times, it has been noticed there was connection between weather conditions and health. As premonition of weather change, lot of people, so-called meteopaths, oftenly have symptoms of mood changes as well as certain health problems. Modern way of life, specially city population, contributes to the fact that more and more people suffer from the influence of meteorological factors to their health and behaviour. As the result of usage of air-conditioners and other appliances which change temperature and humidity in closed spaces compared to the outside environment, people become more sensitive and susceptible to sudden changes of weather conditions. Meteopaths tend to react before weather change and their health problems are connected to weather that is yet to come. Significance of electromagnetic long-term weather forecast is in possible prevention and protecting measures of the endangered population categories, which are sensitive to changes of weather conditions, based on knowledge about negative influence of weather situation on these groups of people or patients suffering from certain diseases. Based on heliocentric electromagnetic long-term weather forecast, doctors-specialists can advise

population how to act and give early warnings to possible health problems, according to forthcoming weather situations and their influence on population's state of health. In that sense, there is great practical need for further development of heliocentric electromagnetic long-term weather forecast considering its accomplishment so far. We must mention that shown analysis which refer only on two cases are not the only ones. With smaller or bigger accuracy, several dozens of forecasts have been made so far, which were published both in printed as well as electronic media.

Apart from climate factors as pre-condition for growing certain agricultural cultures, meteorological conditions are also important for successful agricultural production. Changes of weather situation during development cycles of plants can have negative impact on harvest either by endangering of the crop or its decreasing. Heliocentric electromagnetic weather forecast can be helpful to agricultural population that would be promptly able to protect crops from early frosts, which have specially negative consequences on farming, but also to choose the right moment to use protection. Namely, effective usage of different means against weed, during and after their appliance, depends on weather conditions; therefore it is extremely important to know about the rising of weather conditions. Long-term weather forecast is also important for fishing, as well as the population engaged in cattle breeding or apiculture, so they would be able to plan transport of cattle and bees to mountains in the case of dry summers and lack of pastures.

Climate is common content of tourist propaganda means and motive of tourist movements towards certain destinations. Frequent and abundant rainfalls have negative influence on tourist movements, and long periods without rainfalls with sunny days and high temperatures rush them (Stankovic, 1995). Knowledge about weather conditions that are to come is important for different ways of tourism, travel planning, but also for prevention of risks during stays in nature or performing certain sports (such as rafting, mountain climbing, condition preparations). In tourism, knowing about weather forecast is important both from the aspect of an individual as well as the aspect of tourism as activity. Greater length of forecasted period is specially useful for planning and organization of different tourist manifestations. For each of them, weather performed out in the open or inside, forecasts can have priceless benefits from economic, i.e. managerial aspect. Every further promotion of used method in the context of modelling, as well as its application in any way of manifested tourism, can give significant impulse on the field of organizational needs.

Many human activities are being planned, aimed and organized according usual or for the given territory average meteorological conditions. However, apart from these

common ones, there are also extraordinary and dangerous meteorological appearances, which represent natural extremes that occasionally, due to sensitivity of certain environments and economic potentials, seriously endanger human lives and oftenly cause enormous damages. (Djarmati, Aleksic, 2004). As dangerous meteorological occurrences, most commonly are mentioned: storm wind, severe hail, intensive electric discharges, extraordinary great amounts of rain or snow and thick fogs. It is great practical significance of quality promotion of weather forecast for alleviation or elimination of weather disasters' consequences. On-time informations about weather and early warnings about dangerous meteorological occurrences are pre-condition for prevention and alleviation of accidents which occur due to extraordinary weather conditions (decrease in number of the injured, deceased and material damages). Results of the more quality weather forecasts enable using not only measures of immediate protection, but also preventive ones from certain meteorological disasters.

Application of weather forecast, in the sense of predicting phenomena, intensity and length of certain meteorological conditions, is also important in the traffic, construction activities, protection of the environment (prevention and alleviation of negative effects made by concentrations of polluting materials in the air, prevention of spreading and protection from forest fires caused by weather conditions, avoiding negative effects in the case of accidents by acting in accordance with forecasted weather conditions), work of public services, quantity planning of electrical energy from hydroelectric power plants, as well as other numerous activities, whose successful and economic sustainable work necessarily needs knowledge about upcoming weather conditions. For example, bigger or smaller disposal of certain products on the market can depend at certain extent upon weather conditions.

Conclusion

Bearing in mind wide possibilities of its practical application, it can be ascertained that significance of heliocentric electromagnetic long-term weather forecast is extremely huge, if one could handle informations what weather was to be expected within the next few months with much higher precision. On the other side, we are also aware that risks are extremely high. If the achieved results were to be accepted and proper application was to be found, every unrealisation would have serious consequences.

Viewed at this way, development of synoptic situations depends on whole range of circumstances. Following of energetic regions and coronal holes, as the first step it is necessary to define geo-effective position, which is not static (Meloni et al, 2005). According to Naitamor (2005) from all identified events (from January 1997 to

September 2004) the geo-effective CMEs scattered in latitude (S40, N40) and in longitude (E50, W60). These results also show that 62% events occurred on the west and 38% events in the east. Therefore CMEs which occur in the west part of the sun disk can affect the earth geo-magnetosphere. The width of ejected shaft, broadcasted from the above mentioned sources, directly determines whether they are aimed towards the Earth. Direction of **Bz** component of the interplanetary magnetic field, speed, thickness, temperature, chemical composition and invasive angle of SW into magnetosphere, as well as magnetospheric door's slit size, represent starting elements necessary for making prognostic models. Bearing in mind that SW shaft, when in contact with Earth magnetosphere, is being torn up into more smaller shafts, positioning of locations on Earth to which they would make impact represents great problem.

Acknowledgments

We owe special gratitude to Mr. Milan Stevancevic, who has helped us to great extent during realization of this paper. Certainly, we also owe gratitude to reviewers on their useful suggestions.

References

- Baliunas W, Soon S (2000): The Sun Also Warms. Presented at the GCMI/CEI Cooler Heads Coalition, Washington, DC. <http://www.marshall.org/article.php?id=96>.
- Bhattacharyya S, Narasimha R. (2005): Possible association between Indian monsoon rainfall and solar activity. *Geophysical Research Letters*, vol. 32, L05813, AGU.
- Corbyn P. (2004): Solar wind Technique. <http://www.firstscience.com/site/articles/corbyn.asp>
- Ducic V, Radovanovic M. (2005): The Climate of Serbia. Zavod za udzbenike i nastavna sredstva, Belgrade, (on Serbian).
- Djarmati S, Aleksic Dj. (2004): Destructive Powers. Belgrade.
- Habbal R. S, Woo R. (2004): The solar wind and the Sun-Earth link. *Astronomy & Geophysics*, vol. 45, p. 4.38-4.43.

Landscheidt T. (2000): Solar wind near Earth: indicator of variations in global temperature. European Space Agency Special Publication 463, p. 497 – 500, <http://mitosyfraudes.8k.com/Calen/NinoLand.html>.

Landscheidt T. (2003): Long-range forecast of U. S. drought based on solar activity. <http://www.john-daly.com/solar/US-drought.htm>.

Kristjansson E. J, Staple A, Kristiansen J. (2002): A new look at possible connections between solar activity, clouds and climate. *Geophysical Research Letters*, 29(23), 2107.

Kristjansson E. J, Kristiansen J, Kaas E. (2004): Solar activity, cosmic rays, clouds and climate – an update. *Advances in space research*, 34, p. 407-415.

Meloni P, De Michelis A, Tozzi R. (2005): Geomagnetic storms, dependence on solar and interplanetary phenomena: a review. *Memorie della Società Astronomica Italiana*, Vol. 76 n. 4, MontePorzio Catone, June 27-July 1, 2005, p. 882-887.

Menzel D. (1963): Our Solnce. GIFML. Moscow.

Mukherhee S. (2006): Influence of a Star flare on the Sun-Earth environment and its possible relationship with snowfall. The-Eggs NewsLetter & Information Service of the E_G_U.htm Issue #15 19 April 2006.

Naitamor S. (2005): Coronal Mass Ejection: theirs sources and geomagnetic disturbances, *Memorie della Società Astronomica Italiana*, Vol. 76, MontePorzio Catone, June 27-July 1, 2005, p. 1011-1014.

Palamara R. D, Bryant A. E. (2004): Geomagnetic activity forcing of the Northern Annular Mode via the stratosphere. *Annales Geophysicae*, 22, p. 725-731.

Radovanovic M, Stevancevic M, Strbac D. (2003 a): A Contribution to the Study of the Influence of the Energy of Solar Wind upon the Atmospheric processes. *Collection of Papers* of Geographic Institute “Jovan Cvijic” Serbian Academy of Sciences and Art, No. 52, Belgrade, p. 1-24.

Radovanovic M, Stevancevic M, Strbac D. (2003 b): Influence of the Solar wind energy on the atmospheric processes. *Geophysical Research Abstracts*, Vol. 5, 13963, European Geophysical Society.

Shaviv J. N. (2005): On climate response to changes in the cosmic ray flux and radiative budget. *Journal of geophysical research*, vol. 110, A08105.

Stankovic S. (1995): The Climate as a Tourist Value. *Bulletin of the Serbian Geographical Society*, No 2, Belgrade, p. 61-70, (on Serbian).

Stevancevic M, Radovanovic M, Todorovic N. (2004): The Possibility of Application of Electromagnetic Method in Mid term Weather Forecasting. Collection of Papers EkoIst'04 Ecological Truth, 30. 05. – 02. 06. 2004, Bor, p. 396-399, (on Serbian).

Stevancevic M. (2004): Secrets of the Solar Wind. Belgrade, (on Serbian).

Stevancevic M. (2006): Theoretic Elements of Heliocentric Electromagnetic Meteorology. Belgrade, (on Serbian).

Stevancevic M, Radovanovic M, Todorovic N. (2006): Analysis of characteristic mistakes in the heliocentric electromagnetic long-term forecast. "Tourist Valorisation of Tara", Theme Collection of Geographic Institute "Jovan Cvijic" Serbian Academy for Sciences and Art and Sport-Recreative Center Bajina Bašta, Belgrade, p. 101-110, (on Serbian).

Wang J. (2005): Magnetic fields of Solar Active Regions. Proceedings of the International Astronomical Union, Volume 2004, Issue IAUS223, No. 223, p. 3-12.

Wheeler D. (2001): A verification of U. K. gale forecasts by the 'solar weather technique': October 1995–September 1997. *Journal of Atmospheric and Solar-Terrestrial Physics*, Volume 63, Issue 1 p. 29-34.