PL-SK
2007-2013
... partnerstvom k spoločnému rozvoju ...

Vihorlatská hvezdáreň v Humennom
Humenné

EURÓPSKA ÚNIA
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Vihorlat Observatory in Humenné

invites you to

International Conference

KOLOS 2011

Astronomy and other Natural Sciences in the Life of Society

December 01 – 03, 2011

The 5th conference within the project

Carpathian Sky

Development of tourism products based on astronomy

The conference will take place in DRZ Vihorlat, Snina from 1. to 3. December 2011. The main topic is interaction between astronomy, other natural sciences and everyday life of society. We invite representatives of all institution which carry out research experiments at Astronomical observatory at Kolonica Saddle and scientist who use data collected by astronomical instruments installed there.

Thanks to the project Carpathian sky we can cover all expenses of the conference including accommodation and food.

We expect participants from Slovakia, Ukraine, Poland, Czech Republic, Hungary...

The working language of scientific sessions will be English and Russian.

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Abstract Book

Oral presentations:

F. Chekhonadskykh (1), I. I. Romanyuk (2), D. O. Kudryvtsev (2)

(1) Odessa Astronomical Observatory

(2) SAO AV RAS, Russia

Intrinsic colors and absolute stellar magnitudes of FGK supergiants

Report is devoted to the photometric and spectroscopic characteristics of FGK supergiants. The result of a search for the dependence between the intrinsic color indexes and fundamental parameters of the stellar atmospheres is presented. The overview of the search of calibration relations for obtaining the absolute stellar magnitudes from spectroscopic data is given.

The calculations of intrinsic colors and color excesses using the found dependence were made. We specified these data for 74 supergiants and 164 classical Cepheids. The error in determining of $(B - V)_0$ was less than 0.05m , which yielded us the possibility to obtain E_{B-V} with an accuracy better than 0.2m . Thanks to 80 found calibration relations we developed a technique that allows us to calculate the absolute stellar magnitudes for supergiants based on spectroscopic data. We conducted comprehensive testing of a new technique for the supergiants Galaxy and the Magellanic Clouds. We obtained improved values of absolute stellar magnitudes for 96 supergiants and 53 classical Cepheids. For the testing a new method of determining the M_V on spectroscopic criteria depending on pulsation phase we proposed the research of two classical Cepheids (δ Cep and η Aql) and three s – Cepheids (ζ Gem, FF Aql and V 473 Lyr). We obtained the conclusion that the technique is applicable with high reliability in the phase interval 0.2 — 0.5. Also we concluded that the proposed technique can be used as a spectroscopic method of the pulsation mode identification for Cepheids.

We determined the atmospheric parameters and abundances of 19 chemical elements for the 31 Magellanic Cloud Cepheids for the first time. Thanks to values of studied stars, the mean metallicity of LMC (– 0.20 dex) and MMC (– 0.54 dex) were obtained. These values are somewhat higher than traditional values, which can be explained by the sample of studied objects. As for the features of the chemical composition we would like to note that Na showed no excess, although a small excess was found for some α – elements (Si and S), as well as a marked excess in relation to iron neutron – capture elements. The results are generally in good agreement with previously published data. Along with the analysis of chemical composition, we calculated the absolute magnitudes for some individual objects using the proposed method of the determining M_V on spectroscopic criteria. For 9 LMC Cepheids the values of M_V were determined. Based on these M_V , the distance modulus for the LMC m−M = 18.4m ±0.3m has been defined. From this result we can conclude that the new method for determination M_V is quite applicable to objects from nearby galaxies with a temperate deficit of metals.

The new method of M_V determination for FGK supergiants in our Galaxy and MC has been tested comprehensively, based on this we defined the interval of applicability for the new technique: luminosity types Ia, Ib and II; spectral classes F2 — G8; range of effective temperatures 4500 — 7000 K; interval of the absolute stellar magnitudes from – 0.5m to – 8m ; supergiants must have non-anomalous chemical composition with near – solar metallicity, allowed a temperate deficit of metals.

P. A. Dubovský

Vihorlat Observatory, Humenné, Slovakia

Annual Report on Observational results of AO at Kolonica Saddle

Introductory presentation about observing program at Astronomical Observatory at Kolonica Saddle. Short overview of main observing campaigns during last year, most important results, interesting light curves, new publications based on observations at AO Kolonica Saddle.

P. A. Dubovský

Vihorlat Observatory, Humenné, Slovakia

East European Network of Small Telescopes - ENESTEL

We discuss the possibility to exploit the astronomical instrumentation of The Carpathian Sky project partners for astronomical research and education. Relatively small telescopes can be effectively used in network with different level of access rights.

L. Hric, E. Kundra

Astronomical Institute, Slovak Academy of Sciences

Preliminary discussion on IU Per

Abstract not submitted

M. Hricová Bartolomejová

Slovak Astronomical Society

Mayan Calendar and End of Time 2012

Abstract not submitted

J. Janík

Faculty of Science, Masaryk University Brno

Hot stars in Brno

Abstract not submitted

V. G. Karetnikov, A.V.Dragunova

RI "Astronomical Observatory" of Odessa National University

140 years of the Odessa Astronomical Observatory: personalities, sights, collections.

140-year-old history of the Astronomical Observatory of the Novorossia (Odessa) University (OAO) is illustrated by means of the names of known scientists, objects of cultural heritage, rarity instruments and collections, which are related to OAO.

С. Г. Кашуба, С. М. Андриевский, А. Пихун

Одесская астрономическая обсерватория

Одесская коллекция астрофотопластинок

Презентация доклада о содержании одесской коллекции астрофотонегативов, охватывающей период 1909 - 1998 гг., ее хранении, подготовке и проведении работ по систематизации данных коллекции для размещения в глобальный каталог WFPDB.

Posters:

B. Dębski

Astronomical Observatory of the Jagiellonian University

On sdB+dM systems: from hot subdwarf B stars to planet detection possibilities

Hereby I present few facts about binary systems containing hot subdwarf type B and late-type main sequence star (dwarf M). Using latest publications and data from observational program conducted in the Kolonica Saddle Observatory I will show crucial characteristics of binary systems and sdB stars itself. Following work includes description of hot subdwarfs, main branch of studies on them and newest conclusions of the eclipse timing method.

P. Ďuriš

Slovak Astronomical Society

First results of continuous night sky brightness monitoring at Astronomical observatory at Kolonica Saddle

Abstract not submitted

N. Kablak

Uzhgorod National University, Uzhgorod, Ukraine

Systematic weather forecasting in online mode made to support astronomic observations.

Great potential of GPS system has become available for the recent 30 years [1]. This system is designed for navigation and determination of geographic coordinates of different objects for the purposes of scientific and applied research. The development of RTK (Real Time Kinematic) technology in the evolution of GPS systems as well as joint application of new telecommunication facilities has provided for the wide use of GPS in different areas of navigation, geodesy and cadastre [2]. RTK technology allowed obtaining the level of coordinates with a centimetre precision directly during observations, i.e. time of technological processing is drawn to a minimum and is less dependent on subjective factors, which is very important for large-scale determinations of coordinates. Besides, time spent per determination of coordinates do not exceed several seconds per point. Currently scientific work is held in the area of definition and accounting for errors, which influence GNSS-observations in the network of active referential stations, including research on the influence of atmosphere (troposphere and ionosphere delays) [3].

Researches of troposphere using GNSS-observations are designed to examine weather and climate processes, and eventually, to enhance weather forecasting. [4]. Atmosphere forecast is highly dependant on the data on atmosphere circulation, and the researcher should be aware of the physical processes of dynamic interfusion of mass and energy (as well as radiation influence).

The atmosphere is instable both in vertical and horizontal directions. Dynamics of troposphere is much complicated by the phase of water vapour. The structure of humidity level is rather complex and is influenced by many different processes taking place in different layers of atmosphere. Consequently, it is characterised by natural and accidental changes in time and space. Large-scale irregularities if humidity areas can reach thousand of meters. There can also be small irregularities if humidity areas sized from hundreds of meters to millimetres. Numerical characteristics of water vapour are used in operating meteorology for short-term weather forecasts (distance between stations up to 70 km) and for numerical weather forecasting in climate applications of the whole region (distance between stations up to 100 km). Online weather forecast is usually based on observations as to relative humidity along with pressure and temperature, which are determined using radiosondes and land-based meteorological devices.

A method of evaluation and determination of integrated water vapour (IWV) based on GNSS-observations was developed in the end of last century [4,5]. The advantage of this method is the possibility of its continuous application using the existing GNSS-infrastructure (network of active referential stations with single control centre), as well as the fact that levels of water vapour defined based on GNSS-observation do not depend on the rain or cloudiness.

Therefore, the usage of GNSS allows conducting long-term regional and global monitoring of water vapour levels in the atmosphere. Permanent networks of tracking GNSS-satellites have become extremely important tool for there scientific researches. Such networks are namely IGS (International GNSS Service) and regional EPN network (EUREF Permanent Network) [6,7]. They also include national networks of referential stations working in permanent mode, and in the recent years – networks of active referential stations, which allow users to receive results of observations in online mode.

Continuous determination of water vapour on large territories allows to determine and forecast water vapour dynamics, and hence, atmospheric precipitation in online mode. Ukraine borders four countries, where there are functioning networks of active referential stations: SKPOS (Slovakia), GNSSnet.hu (Hungary), ROMPOS (Romania), ASG-EUPOS (Poland) [8-11]. In Ukraine the first network of active referential stations ZAKPOS/UA-EUPOS was created in Transcarpathian region [12]. ZAKPOS (Transcarpathian Position Determination System) was created in 2008 in Transcarpatian region with computational centre in Mukachevo. The purpose of system creation is to satisfy needs of geodesic companies in high-precision GPS observations, in RTK mode in the first place. ZAKPOS network is fully built according to the principles and requirements of EUPOS [13,14]. It uses hardware and software made by Trimble. During 2009-2011 ZAKPOS network was developed to cover neighbouring regions: Lviv, Volyn, Rivne, Chernivtsi, Ivano-Frankivsk, Ternopil, Khmelnytsky. Effectively, ZAKPOS has become the network of western Ukraine. Due to geographical location of Transcarpathian region and cross-border cooperation with European countries we can have precise, dense and frequent sample of IWV values to cover large territories, which allows determining and forecasting dynamics of water vapour on large territories in online mode. The purpose of this work is to determine precision of precipitation of water vapour based on network GNSS data.

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3. Каблак Н. І. Оцінка впливу атмосфери у мережі активних референцних GNSS-станцій // Геодезія, картографія і аерофотознімання. Вип. 73, Львів-2010.- с. 17-21.

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7. IGS: http://igscb.jpl.nasa.gov

8. Офіційний сайт: http://www.skpos.gku.sk

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10. Офіційний сайт:http://www.rompos.ro

11. Офіційний сайт:http://www.asgeupos.pl

12. Офіційнийсайт: http://www.zacpos.zakgeo.com.ua

13. Офіційний сайт Європейської GNSS мережі EUPOS // www.eupos.org.

14. Інтернет ресурс Німецької мережі SAPOS // http://www.sapos.de/

M. Paruch (1), G. Sęk (2)

(1) I Liceum Ogólnokształcące, Bochnia, Polska

(2) Młodzieżowe Obserwatorium Astronomiczne w Niepołomicach

Total lunar eclipse

Poster presented total lunar eclipse observed by use Slooh Space camera 15th of June 2011 was prepared.

P. Sowicka, J. Put

Astronomical Observatory of the Jagiellonian University

V795 Her - a hard nut to crack

We analyzed archival observational data on object changes in brightness. After selection we chose data from telescope Pupava in filter V. Then we did period analysis and received change the value of the period as 0.1154 d. After subtraction the periodic curve with proposed period the brightness distribution shown no periodicity. If periodicity exist, it is covered by noise. We conclude no periodicity brighter then 0.1 mag. More observations with less dispersion are needed.

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