

ABSTRACTS

of the scientific publications submitted by Assoc. Prof. Dr.Sci. Neyko Mateev Neykov, for participation in the competition for academic position “Professor” in professional direction

4.1. Physics scientists, scientific specialty „Meteorology“ (Stochastic modeling in meteorology and hydrology) at group “Nonstandard forecasts”, Forecasting department, National Institute of Meteorology and Hydrology, announced in State newspaper 62/06.08.2019

№	Type of publication, authors, title, publisher, ISBN/ISSN, SJR, abstract
I. Monograph	
1	<p>Neykov, N.M. and Neytchev, P.N. (2019). Stochastic daily precipitation model for Bulgaria. Regalia 6, Sofia, 267 pages, ISBN: 978-954-745310-4</p> <p>Abstract: The monograph is devoted to the development of stochastic daily precipitation at-site models. The methodology for stochastic daily precipitation modeling is considered in chapter 2. From statistical point of view, daily precipitation data are time series with a mixed density comprising a discrete component at zero for dry days and a continuous right skewed distribution on the positive line for wet days. Fitting such mixed distributions to data is factorized to fitting two one-dimensional autoregressive time series with Bernoulli (binary) and right-skewed distributions by means of the generalized linear models. Chapters 3 and 6 of the monograph are an illustration of this methodology in development of specific models, with or without the use of meteorological predictors, based on a large number of NIMH network stations located in areas with different physical and geographical characteristics on the territory of Bulgaria. In chapter 4 a "weather generator" for daily precipitation totals, minimum and maximum temperatures for Knezha and Sadovo stations is developed. The “weather generator” is defined as a joint probability distribution of these three meteorological elements. Chapter 5 deals with effect of climate change on the stochastic model parameters of the daily precipitation in Bulgaria.</p>
II. Scientific papers	
2	<p>Neykov, N.M. and Neytchev, P.N. (2017a). Development of stochastic daily weather generator conditional on atmospheric circulation, part 1: Daily precipitation model. <i>Bulg. J. Phys.</i> vol. 44, pp. 162-188, ISSN: 1310-0157.</p> <p>Abstract: Development of stochastic daily precipitation models is considered for 32 sites in Bulgaria. The precipitation processes are modeled as a two-state first-order nonstationary Markov model with mixed transition density of a discrete component at zero and a continuous component describing non-zero amounts. Binary logistic regression is used to fit the occurrence data, and the intensity series is modeled by gamma distribution. Standard software for generalized linear models is used to perform the computations. Several atmospheric indices based on NCEP/NCAR reanalysis data over 15 grid points surrounding Balkan Peninsula are used as predictors. Detailed validation is carried out on various aspects of the model for stations Kneja and Sadovo. The proposed model reproduces well the precipitation statistics for the observed and reserved.</p>

3	<p>Neykov, N.M. and Neytchev, P.N. (2017b). Development of stochastic daily weather generator conditional on atmospheric circulation, part 2: Daily minimal and maximal temperature models. <i>Bulg. J. Phys.</i> vol. 44, pp. 189-204, ISSN: 1310-0157.</p> <p>Abstract: A „stochastic weather generator” is developed to generate synthetic (model) time series of daily precipitation totals, minimal and maximal temperatures for Kneja and Sadovo stations. The generator is a joint distribution of these meteorological elements. The model consists of interdependent components: a daily precipitation occurrence and amounts components developed by Neykov and Neytchev (2017a) and two Gaussian autoregressive models corresponding to the minimal and maximal temperatures components. Several atmospheric indices based on NCEP/NCAR reanalysis data over 15 grid points surrounding Balkan Peninsula are used as predictors. Standard software for generalized linear models is used to perform the required computations. The proposed models reproduce reliably different statistical characteristics of the daily precipitation totals in the training and test samples. Some potential difficulties and ways to overcome them are discussed.</p>
4	<p>Damyanova, E., Neykov, N.M., Ivanov, M. and Benderev, A. (2017). Influence of natural factors on the regime of the largest karst springs in northwestern Bulgaria. In: <i>Electronic book with full papers of the XXVII Conference of the Danubian Countries on Hydrological Forecasting and Hydrological Bases of Water Managment</i>, 26-28 September 2017, Golden Sands, Bulgaria, Ninov, P. and Bojilova, E.(eds.), ISBN 978-954-90537-2-2</p> <p>Abstract: The standard monthly and annual statistical characteristics of 8 karst springs flows located at the North-Western Bulgaria from the National Monitoring Network of Bulgaria, are calculated. The monthly distributions of these spring flows are characterized by boxplots. Change points of the annual karst spring flow are identified during the 80-ties of the last century using the Pettint test. For each spring time series data nonlinear annual trends based on the lowess procedure for robust estimation and smoothing were determiend. Both approaches are complementary and give similar results regarding the change point of the karst sring flow. The most likely reason for the change in the flow regime of these karst springs is due to the long-term drought in northwestern Bulgaria.</p>
5	<p>Neykov, N.M., Galabov, V., Kortcheva, A., Neytchev, P.N. (2017). Return value estimates of significant wave height along Bulgarian Black Sea coast. <i>Bul. J. Meteorology and Hydrology</i>, vol. 22/1-2. pp. 2-17, ISSN: 0861-0762.</p> <p>Abstract. The classical monthly block maxima approach in extreme value analysis is adapted for the estimation of the return values of significant wave (Hs) heights hindcast data at the open-sea locations near Shabla, Emine and Ahtopol stations in the western Black Sea. The hindcast data consists of 3 hourly generated data by the Simulating Waves Nearshore (SWAN) model covering the period of 111 years (1901–2010). The ERA-CLIM wind fields produced by the European Center for Medium-Range Weather Forecasts (ECMWF) are used to force the SWAN model. The standard and profile likelihood return values are computed for several return periods and compared with previously estimated return values based on visual observations.</p>
6	<p>Neykov, N.M. and Neytchev, P.N. (2016). Stochastic downscaling of daily precipitation over Bulgaria through hidden Markov models: Precipitation amount simulation at site that does not belong to the network of stations. In: <i>Proc. of the 3rd Bulg. National Congress on Physical Sciences</i>, Heron Press: Sofia, ISBN: DVD:978-954-580-364-2</p>

	<p>Abstract. An eight states multi-site non-homogeneous hidden Markov model that links daily precipitation amounts data at a network of 31 stations broadly covering the territory of Bulgaria to large-scale atmospheric patterns over Europe-Atlantic region is developed. A technique to simulate daily precipitation amount at sites that belong to the network of stations, not explicitly included in this multi-site model is considered. The results show that the downscaled simulations reproduce well the observed precipitation amount, the wet and dry spell length distributions.</p>
7	<p>Neykov, N.M., Neytchev, P.N. and Zucchini, W. (2014). Stochastic daily precipitation model with a heavy-tailed component. <i>Nat. Hazards Earth Syst. Sci.</i>, vol. 14, pp. 2321-2335, ISSN: 1684-9981, SJR-Q1.</p> <p>Abstract. The stochastic daily precipitation models are commonly used to generate scenarios of climate variability or change on a daily timescale. From statistical point of view, daily precipitation data are time series with a mixed density comprising a discrete component at zero for dry days and a continuous right skewed distribution on the positive line for rainy days. The standard stochastic daily precipitation models consist of two components describing the occurrence (dry and wet states), and intensity series (the wet days amount), respectively. Standard software for generalized linear models can be used to perform the computations. Binary logistic regression is used to fit the occurrence data whereas the intensity series is modeled using a continuous-valued right-skewed distribution, such as exponential, gamma, Weibull or lognormal. Predictors such as finite Fourier series and/or atmospheric derivatives characterizing the precipitations can be included in these models in a standard way. A well-known drawback of these models is that they do not produce a sufficiently heavy upper tail for the distribution of daily precipitation amounts; they tend to underestimate the frequency of large storms. In this study, we adapted the approach of Furrer and Katz (2008) who developed a hybrid distribution between gamma distribution and the tail of the generalized Pareto distribution in order to correct for the above shortcoming. Following their approach, we developed a hybrid distribution between the Weibull distribution and the tail of the Pareto distribution in order to model the daily precipitation totals over the entire spectrum of values. We used these two type of hybrid distributions in order to develop stochastic daily precipitation model for the daily precipitation at Ihtiman station located in western Bulgaria for the period 1960-2007 yrs. We report the results of simulations designed to compare the models based on the hybrid distributions and those based on the standard distributions. Some potential difficulties are outlined.</p>
8	<p>Neykov, N.M., Neytchev, P. N. and Zucchini, W. and Hristov, H. (2012). Linking atmospheric circulation to daily precipitation patterns over the territory of Bulgaria. <i>Environ. Ecol. Stat.</i>, vol. 19, pp. 249-267., ISSN: 1352-8505, 1573-3009, SJR-Q2.</p> <p>Abstract: An eight states non-homogeneous hidden Markov model is developed for linking daily precipitation amounts data at a network of 32 stations broadly covering the territory of Bulgaria to large-scale atmospheric patterns. At each site a 40-year record 1960-2000 of daily October–March precipitation amounts is modeled. The atmospheric data consists of daily sea-level pressure, geopotential height at 500 and 850hPa, air temperature at 850hPa and relative humidity at 700 and 850hPa on a 2.5×2.5 grid based on NCEP-NCAR reanalysis data set covering the Europe-Atlantic sector 30°W–60°E, 20°N-70°N for the same period. The first 30 years data are used for model fitting purposes while the remaining 10 years are used for model evaluation. Detailed model validation is carried out on various aspects. The proposed model reproduces well the rainfall statistics for the observed and reserved data whereas the identified states are found to be physically interpretable in terms of regional climatology.</p>

9	<p>Neytchev, P. N. and Zucchini, W., Neykov, N.M. and Hristov, H. (2011). Drought study based on multi-site daily precipitation model applied for Bulgaria. <i>Bul. J. Meteorology and Hydrology</i>, vol. 16, pp. 54-61, ISSN: 0861-0762.</p> <p>Abstract. Since 2005 we have been investigating the use of the non-homogeneous hidden Markov model to link synoptic-scale atmospheric circulation variables to daily precipitation data at a network of rain gauge stations broadly covering the territory of Bulgaria via several hidden states. The aim of the present work is to answer specific questions relating to precipitation of Bulgaria, including drought related events and to gain insights into inter-annual climate variability, detection and attribution to climate change for the cold half-year for the period 1960-2000. To achieve this aim daily precipitation totals and atmospheric data consisting of daily sea-level pressure, geopotential height at 500 and 850hPa, air temperature at 850hPa and relative humidity at 700 and 850hPa on a 2.5×2.5 grid based on NCEP-NCAR reanalysis data set covering the Europe-Atlantic sector 30°W–60°E, 20°N-70°N for the same period are used. Risks associated with 30 consecutive dry days, risks associated with 3, 5 and 7 consecutive years with minimum precipitation amounts during the the cold half of the year are characterized. We can confirm that the above model is a useful research tool for investigating the relationship between large-scale climatic processes and local precipitation.</p>
10	<p>Neykov, N.M., Valkov, N., Neytchev, P.N. and Batchvarova, E. (2010). Fitting Tweedie distribution time series regression model to NO₂ data for Sofia 2001-2006. <i>Bul. J. Meteorology and Hydrology</i>, vol. 15, pp. 36-49, ISSN: 0861-0762</p> <p>Abstract. In this paper we analyze NO₂ data accomplished with meteorological parameters – air temperature and humidity parameters – air temperature and humidity at 2 m height, wind at 10 m, precipitation and cloudiness from the meteorological station located at NIMH, east part of Sofia. In addition, we extract from aerological soundings at the same place data for the Convective Boundary Layer or Mixed Layer Height (also called traditionally Mixing Height (MH) in air pollution studies). For this purpose we developed an automatic procedure to screen the radiosoundings. We fit the NO₂ data by a time 2 series regression model with Tweedie distribution. The model describes reasonably the observations. The model can be used for prediction of NO₂ conditional on 2 weather variables. Moreover, the model can be used for assessing air pollution changes due to the global change.</p>
11	<p>Staneva, J., Todorova, M., Neykov, N.M. and Evstatieva, L. (2009). Ultrasonically Assisted Extraction of Total Phenols and Flavonoids from <i>Rhodiola rosea</i>. <i>Natural Product Communications</i>. 4, 935-938. ISSN: 1934-578X; 1555-9475, SJR-Q3.</p> <p>Abstract. This work deals with ultrasonically assisted extraction (UAE) of biologically active compounds from rhizomes of <i>Rhodiolarosea</i>, a popular medicinal plant. The influence of temperature, type of solvent and solid/solvent ratio on the yield of total extracts, total phenols and flavonoids was established. The best extraction of total phenols and flavonoids was achieved by using 50% aqueous EtOH and MeOH, respectively. Five times increase of solid/solvent ratio (from 1:20 to 1:100 (w/v)) leads to slow increase of the yield of total phenols and flavonoids. The extraction effectiveness of conventional maceration with 50% EtOH and UAE performed for 1 h at 25°C using the same solvent with respect of total phenols was comparable.</p>
12	<p>Machkova, M., Velikov, B., Dimitrov, D., Neykov, N.M. and P. Neytchev (2008). Quality status of the Upper Thracian Plio-Quaternary Aquifer, South Bulgaria. In: <i>Natural Groundwater Quality</i>. W. M. Edmunds and P. Shand (eds.), Blackwell Publishing, Chapter 18, pp 391-403</p>

	<p>Abstract. The quality of groundwaters in the Upper Thracian Plio-Quaternary aquifer (South Bulgaria) was studied in order to determine the baseline concentrations and main factors influencing them. Detailed sampling of groundwaters was implemented and an extensive set of major and trace elements and other hydrochemical characteristics were determined to elucidate the present hydrochemical conditions of water bodies. Standard statistical methods and software were used to analyse modern and historical data. Despite the fact that the area is quite densely populated and industry and agriculture are well established, most of the studied waters were of good quality with respect to many elements. The observed trends for different hydrochemical parameters are due to the influence of both natural and anthropogenic factors. Baseline values cannot be clearly distinguished, as they are often masked by the influence of the anthropogenic factors. Along with general decreasing trend of groundwater levels, decreasing trends for pH and Ca and increasing trends in Na and Cl are recognised. An analysis of spatial variability of hydrochemical components indicates the role of the main river channel as a dividing line in the aquifer. The lack of exchange of waters between the northern and southern parts of the aquifer highlights two different spatial distributions of the hydrochemical parameters on either side of the river.</p>
13	<p>Neytchev, P.N., Neykov, N.M., Zucchini, W. and Hristov, H. (2008). Statistical Linkage of Daily Precipitation in Bulgaria to Atmospheric Circulation. In: <i>Proc. of the XXIV Conference of the Danubian Countries on the Hydrological Forecasting and Hydrological Bases of Water Management</i>, Brilly, M. and Sraj, M.(eds.),2-4 June, Bled, Slovenia, ISBN 978-961-91090-2-1.</p> <p>Abstract. An eight state non-homogeneous hidden Markov model (NHMM) is developed for linking daily precipitation amounts data at a network of 32 stations broadly covering the territory of Bulgaria to large-scale atmospheric patterns. At each site a 40-year record 1960-2000 of daily October-March precipitation amounts is modeled. The paper is a continuation of Neytchev et al. (2006) who studied the cold half years period 1978-1988. The atmospheric data consists of daily sea-level pressure, geopotential height at 500 and 850 hPa, air temperature at 850 hPa and relative humidity at 700 and 850 hPa on a 2.5° x 2.5° grid based on NCEP-NCAR reanalysis data set covering the Europe-Atlantic sector 30°W–60°E, 20°N–70°N for the same period. The first 30 years data are used for model fitting purposes while the remaining 10 years are used for model evaluation. Detailed model validation is carried out on various aspects. The proposed model reproduces well the rainfall statistics for the observed and reserved data whereas the identified states are found to be physically interpretable in terms of regional climatology.</p>
14	<p>Neykov, N.M., Neytchev, P. N., Van Gelder, P.H.A.J.M. and Todorov, V.K. (2007). Robust detection of discordant sites in regional frequency analysis. <i>Water Resour. Res.</i>, vol. 43, W06417, ISSN: 0043-1397, SJR-Q1.</p> <p>Abstract. The discordancy measure in terms of the sample L-moment ratios (L-CV, L-skewness, L-kurtosis) of the at-site data is widely recommended in the screening process of atypical sites in the regional frequency analysis (RFA). The sample mean and the covariance matrix of the L-moments ratios, on which the discordancy measure is based, are not robust against outliers in the data, and consequently, this measure can be strongly affected by the discordant sites present in the region. We propose to replace the classical mean and covariance matrix estimates by their robust alternatives on the basis of the minimum covariance determinant estimator. The performance of the classical and robust measures for discordant sites identification is assessed in a series of Monte Carlo simulation experiments within the framework of the RFA. The simulation study shows</p>

	that the robust discordant measure outperforms the classical one and is consistent with the heterogeneity measure H. Thus we recommend its use as a tool for discordant sites detection and formation of homogeneous regions in RFA.
15	<p>Neytchev, P. N., Zucchini, W., Hristov, H. and Neykov, N. M. (2006). Development of a multisite daily precipitation model for Bulgaria using hidden Markov models. In: <i>Proc. of the XXIIIrd conference of Danubian countries on the hydrological forecasting and hydrological bases of water management</i>. Belgrade, Serbia, 28-31 August, S. Bruk and T. Petkovic (eds.).</p> <p>Abstract. The non-homogenous hidden Markov Models (NHMM) have found widespread application in meteorology and hydrology because are adequate tools in cases the observations appear sequentially in time and tend to cluster or to alternate between different possible states. The NHMM links large-scale atmospheric patterns to daily precipitation data at a network of rain gauge stations, via several hidden (unobserved) states called the "weather states". Details can be found in Zucchini and Guttorp (1991), Hughes and Guttorp (1994), Hughes et al. (1999), Charles et al. (1999a), Charles et al. (1999b), Bellone et al., (2000), Charles et al. (2003) and Charles et al. (2004) to name a few. The evolution of these states are modeled as a first-order Markov process with state-to-state transition probabilities conditioned on some indices of the atmospheric measurements. Due to these weather states the spatial precipitation dependence can be partially or completely captured, see Hughes et al. (1999). In the present study various NHMMs are used to relate daily precipitation at 31 rain gauge stations covering broadly the territory of Bulgaria to synoptic atmospheric data. A 15-year record (1972-1987) of daily winters (October through March) precipitation totals is used at each station. The atmospheric data consists of daily sea-level pressure, geopotential height at 500 hPa, air temperature at 850 hPa and relative humidity at 700 and 850 hPa on a 2.5°x2.5° longitude-latitude grid based on NCEP-NCAR reanalysis dataset covering the Europe-Atlantic sector (30°W-60°E, 20°N-70°N) for the same period. The first 10 years data are used for model fitting purposes while the remaining 5 years are used for model evaluation. A detailed validation is carried out on various aspects of the model. The identified weather states are found to be physically interpretable whilst the fitted models reproduce well the rainfall statistics for the historical and reserved periods.</p>
16	<p>Neykov, N.M., Neytchev, P. N. and Zucchini, W. (2003b). Detecting precipitation climate changes: An approach based on a stochastic daily precipitation mode. <i>Pliska Stud. Math. Bulgar.</i> vol.14, pp. 91-106, ISSN: 0204-9805.</p> <p>Abstract. We consider development of stochastic daily precipitation models for some sites in Bulgaria. The precipitation process is modelled as a two-state first-order nonstationary Markov model. Both the probability of rainfall occurrence and the rainfall intensity depend on the intensity on the preceding day. To investigate the existence of long-term trend and of changes in the pattern of seasonal variation we use a synthesis of the methodology based on the two-state first-order nonstationary Markov model and the idea behind the classical running windows technique for data smoothing. The resulting time series of model parameters are used to quantify changes in the precipitation process over the territory of Bulgaria.</p>
17	<p>Neykov, N.M., Neytchev, P. N., Zucchini, W., M. Parker (2003a). Stochastic modelling of hourly and daily precipitation in Bulgaria. In: <i>Proc. of the 8th BNAWQ Scientific and Practical Conference "Water Quality Technologies and Management in Bulgaria"</i>, 19-21 February 2003, Sofia, pp. 128-135.</p>

	<p>Abstract: We consider development of hourly and daily precipitation models for some sites in Bulgaria. The precipitation processes are modeled as a two-state first-order nonstationary Markov model with mixed transition density of a discrete component at zero and a continuous component-describing non-zero amounts. Binary logistic regression is used to model the occurrence time series data whereas gamma regression model is used to model the intensity data. Finite Fourier series is used as predictor in both models. Standard software for generalized linear models is used to perform the computations. The simulated precipitation sequences well preserve the properties of the observed sequences.</p>
18	<p>Van Gelder, P.H.A.J.M., Neykov, N.M., Neytchev, P.N., Vrijling, J. K. and Chbab, H. (2001). Probability distributions of annual maximum river discharges in North-Western and Central Europe. In: <i>Foresight and Precaution</i>, vol. 2, Cottam, M.R., Harvey, D.W., Pape, R.R. and J. Tait (eds.), A.A. Balkema publishing, 899-903, ISBN: 978-90-5809-142-0, SCOPUS.</p> <p>Abstract. The goal of this study is to evaluate the goodness of fit of alternate probability distribution functions (PDFs) to sequences of annual maximum streamflows in North-Western and Central Europe. The study provides some guidance on which PDF is a reasonable approximation. To achieve this goal L-Moment diagrams are constructed for annual maxima streamflows at more than 200 river basins in Germany, Belgium, France, Luxemburg, The Netherlands, Switzerland, Austria, Czech Republic, Poland, Slovakia, Hungary and the UK. Homogeneous regions are derived on the base of statistical techniques and physical-based considerations. Goodness of fit comparisons reveal which distribution functions provide the best approximations to the distribution of the annual maxima flood flows for each homogeneous region.</p>
19	<p>Van Gelder, P.H.A.J.M., De Ronde, J.G., Neykov, N.M. and Neytchev, P. N. (2001). Regional frequency analysis of extreme wave heights: trading space for time. In: <i>Coastal Engineering 2000</i>, vol. 2, B.L. Edge (ed.), pp. 1099-1112, ISBN: 9780784405499, SCOPUS.</p> <p>Abstract. In this paper an improved regional frequency analysis (RFA) is suggested in order to obtain more accurate estimators of the wave height distribution functions in the North Sea. Instead of the classical test of Wilks for discordant sites detection in formation of homogeneous region within the RFA a robust alternative of this test is proposed in terms of the L-moments triple (L-CV, L-skewness, L-kurtosis).</p>
20	<p>Atanasov, D. and Neykov, N.M. (2001). On the Finite Sample Breakdown Point of the WLTE(k) Estimators and d-fullness of a Set of Continuous Functions. In: <i>Proceedings of the 6th International Conference on Computer Data Analysis and Modeling</i>. S. Aivazian, Yu. Kharin, and H. Reider (eds.), 10-14 September 2001, Minsk, Belarus, vol 1, pp. 52-57, ISBN 985-445-490-8.</p> <p>Abstract. An easy verifiable condition for subcompactness of continuous function is given. The Index of fullness of the set of log likelihoods functions for the Poisson distribution, the lognormal distribution and the unidimensional unfolding robust metric is derived. As a consequence, the finite sample Breakdown Point (BP) of the Weighted Least Trimmed Estimators of order k (WLTE(k)) is studied</p>
21	<p>Vasilev, A, Zlatkova, M., Neykov, N. M. (1982). Spatial adaptation and line fitting. Processing of information in the visual system - higher visual functions, edited by B. D. Glaser, Hauka, Leningrad, 45-50 pages, (in Russian).</p>

	<p>Abstract: The article is devoted to the analysis of data from a psychophysiological experiment of spatial adaptation and the detection of lines in human visual perception. The identification of the lines from the experimental data is based on the nonlinear regression analysis.</p>
	<p>III. Technical Reports and Reviews</p>
22	<p>Zucchini, W., Neytchev, P.N., Neykov, N.M., and Hristov, H. (2008). <i>Statistical Linkage of Daily Precipitation in Bulgaria to Large-scale Atmospheric Circulation Measures</i>. Report on the project conducted within the framework of cooperation between Deutsche Forschungsgemeinschaft and the Bulgarian Academy of Sciences. Grant 436 BUL 113/136/0-1 of the DFG, 175 pages</p> <p>Note: The main results of this TR are published as separate papers with the following numbers [2, 3, 6, 8, 9, 13, 15].</p>
23	<p>Zucchini, W., Neykov, N.M. and Neytchev, P.N. (2001). <i>An Assessment of the Effects of Climate Change on Precipitation in Bulgaria</i>. Report on the project conducted within the framework of cooperation between Deutsche Forschungsgemeinschaft and the Bulgarian Academy of Sciences. Grant 436 BUL 17/6/01/ of the DFG, 101 pages.</p> <p>Note: The main results of this TR are published in [6] and chapter 5 of [1].</p>
24	<p>Zucchini, W., Neykov, N.M. and Neytchev, P.N. (2001). <i>Development of a Daily Precipitation Model for South-west Bulgaria</i>. Report on the project conducted within the framework of cooperation between Deutsche Forschungsgemeinschaft and the Bulgarian Academy of Sciences. Grant 436 BUL 112/12/00/ of the DFG, 69 pages</p> <p>Note: The main results of this TR are published in [17] and chapter 6 of [1]</p>
25	<p>Neykov, N.M. (1998) Review: Regional Frequency Analysis: An Approach Based on L-Moments by J. R. M. Hosking J. R. Wallis. J. Royal Statistical Society. Series D (The Statistician), Vol. 47, No. 4, pp. 720-721</p> <p>Note: The idea of the robust alternative of the Wilks test for discordant site detection within the framework of the Regional Frequency Analysis is proposed in this review. The publications [14, 18, 19] are based on the robust alternative of the Wilks test.</p>