Záznamy vložené do ASEP za UI (1. 12. – 31. 12. 2021)
Records of ICS in ASEP (1. 12. – 31. 12. 2021)

0549871 - ÚI 2022 CZ eng J - Článek v odborném periodiku
Kerechanin, J. V. - Frolov, A. A. - Bobrov, P.D. - Húsek, Dušan
Independent EEEG Components Are Meaningful (For Bci Based On Motor Imagery).
Neural Network World. Submitted 2020, 865-3728-1-SM (2022). ISSN 1210-0552
Impakt faktor: 1.518, rok: 2020
Trvalý link: http://hdl.handle.net/11104/0325765

0550746 - ÚI 2022 RIV GB eng J - Článek v odborném periodiku
Filip, P. - Burdová, K. - Valenta, Zdeněk - Jech, R. - Kokošová, V. - Baláž, M. - Mangia, S. - Michaeli, S. - Bareš, M. - Vojtíšek, L.
Tremor associated with similar structural networks in Parkinson's disease and essential tremor.
Parkinsonism & Related Disorders. Roč. 95, February 2022 (2022), s. 28-34. ISSN 1353-8020. E-ISSN 1873-5126
Grant CEP: GA MŠk(CZ) LM2018129
Institucionální podpora: RVO:67985807
Klíčová slova: Tremor * Probabilistic tractography * Structural connectome * Parkinson's disease * Essential tremor
Obor OECD: Clinical neurology
Impakt faktor: 4.891, rok: 2020
Způsob publikování: Omezený přístup
DOI: 10.1016/j.parkreldis.2021.12.014
Introduction: Despite substantial clinical and pathophysiological differences, the characteristics of tremor in Parkinson's disease (PD) and essential tremor (ET) patients bear certain similarities. The presented study delineates tremor-related structural networks in these two disorders. Methods: 42 non-advanced PD patients (18 tremor-dominant, 24 without substantial tremor), 17 ET, and 45 healthy controls underwent high-angular resolution diffusion-weighted imaging acquisition to reconstruct their structural motor connectomes as a proxy of the anatomical interconnections between motor network regions, implementing state-of-the-art globally optimised probabilistic tractography. Results: When compared to healthy controls, ET patients exhibited higher structural connectivity in the cerebello-thalamo-cortical network. Interestingly, the comparison of tremor-dominant PD patients and PD patients without tremor yielded very similar results – higher structural connectivity in tremor-dominant PD sharing multiple nodes with the tremor network detected in ET, despite the generally lower structural connectivity between basal ganglia and frontal cortex in the whole PD group when compared to healthy controls. Conclusion: The higher structural connectivity of the cerebello-thalamo-cortical network seems to be the dominant tremor driver in both PD and ET. While it appears to be the only tremor-related network in ET, its combination with large scale hypoconnectivity in the frontal cortico-subcortical network in PD may explain different clinical features of tremor in these two disorders.
Trvalý link: http://hdl.handle.net/11104/0326049

0549815 - ÚI 2022 RIV CZ eng M - Část monografie knihy
Geletič, Jan - Řadová, Jana - Resler, Jaroslav - Krč, Pavel - Eben, Kryštof - Belda, M. - Fuka, V. - Vlček, O.
Assessing the Sensitivities of Urban Climate Model PALM-4U.
Supercomputing in Science and Engineering 2019–2020. Ostrava: VSB – Technical University of

Ostrava, 2021 - (Vondrák, V.; Kozubek, T.; Jansík, B.), s. 31-33. ISBN 978-80-248-4567-8
Institucionální podpora: RVO:67985807
https://www.it4i.cz/file/be151db89e56452e36511f5410126441/6419/Supercomputing%20in%20Science%20and%20Engineering%202019-2020.pdf
Investigation of the urban climate, and especially that of the urban heat island (UHI) phenomenon, still faces new challenges. Even with increasing computational capabilities and geographic information systems (GIS), there is a need for standardized research methods. Furthermore, research output should be applicable in practise. Microscale meteorological and climate models have been increasingly used for simulations of real urban city environments and especially the impacts of changes in the city structure on the environmental conditions that affect the inhabitants. In this context, various UHI mitigation measures are being considered, with greening of the environment as a typical example. Application of these measures, ´however, needs some prior information about their potential effectiveness or a cost-benefit analysis. For that, it is important to know how sensitive the environment is to the city layout (e.g., building height or
street width) and the material-specific parameters used to describe urban surfaces (e.g., reflectivity or roughness). Currently, the demand for scientifically-based urban climate studies is growing, particularly model-based studies that can provide reliable projections on a city or street-level scale.
Trvalý link: http://hdl.handle.net/11104/0325710

0549809 - ÚI 2022 RIV CZ eng M - Část monografie knihy
Resler, Jaroslav - Krč, Pavel - Geletič, Jan - Fuka, V.
Validation and Parallel Benchmarking of the New Radiative Transfer Model Version 3.0 for PALM-4U Urban Climate Model.
Supercomputing in Science and Engineering 2019–2020. Ostrava: VSB – Technical University of Ostrava, 2021 - (Vondrák, V.; Kozubek, T.; Jansík, B.), s. 26-27. ISBN 978-80-248-4567-8
Institucionální podpora: RVO:67985807
https://www.it4i.cz/file/be151db89e56452e36511f5410126441/6419/Supercomputing%20in%20Science%20and%20Engineering%202019-2020.pdf
PALM is an open-source large-eddy atmospheric model developed jointly by Leibniz University of Han- over and other European academic institutions. The Institute of Computer Science is the main author ofthe urban surface energy balance model (USM) and the multi-reflection radiative transfer model (RTM) for PALM. The current PALM version (6.0) contains an overall upgrade of the RTM (version 3.0), which increases the scope of modelled processes and enables modelling of larger areas by utilizing new algorithms with im- proved efficiency and scalability and reduced computational complexity. During the development and testing of this new complex model, we needed to run multiple simulations to verify the correctness and convergent properties of the model using different scenarios, and to test the scalability and efficiency of the parallelization. This new version was described in the Geoscientific Model Development journal (GMD).
Trvalý link: http://hdl.handle.net/11104/0325706

0549813 - ÚI 2022 RIV CZ eng M - Část monografie knihy
Vlček, O. - Benešová, N. - Belda, M. - Fuka, V. - Resler, Jaroslav - Eben, Kryštof - Geletič, Jan - Krč, Pavel - Rosecký, Martin
Validation of the Model PALM-4U against Observation Campaign in Prague-Dejvice.
Supercomputing in Science and Engineering 2019–2020. Ostrava: VSB – Technical University of Ostrava, 2021 - (Vondrák, V.; Kozubek, T.; Jansík, B.), s. 28-30. ISBN 978-80-248-4567-8
Institucionální podpora: RVO:67985807
https://www.it4i.cz/file/be151db89e56452e36511f5410126441/6419/Supercomputing%20in%20Science%20and%20Engineering%202019-2020.pdf

Investigation of the urban climate has become very important during recent years and aims to help urban city authorities to plan efficient and economically feasible mitigation strategies to counteract the adverse effects of the urban heat island phenomenon (UHI). Different modelling approaches have been used for this purpose and models based on computational fluid dynamic (CFD) techniques represent the most advanced method. Two main approaches are used in this category. The Reynoldsaveraged Navier–Stokes equations (RANS) method calculates only the mean flow while the turbulence is fully parameterized, while the large-eddy simulation (LES) approach models explicitly the resolved turbulent flow and parameterizes only the subgridscale unresolved turbulence. The LES approach is more computationally demanding, but many studies have shown that it significantly outperforms RANS for simulations in complex urban environments.
Trvalý link: http://hdl.handle.net/11104/0325709

0549074 - ÚI 2022 RIV CH eng J - Článek v odborném periodiku
Brož, J. - Campbell, M. D. - Urbanová, J. - Nunes, M. A. - Brunerová, L. - Rahelic, D. - Janíčková Žďárská, D. - Taniwall, A. - Brabec, Marek - Berka, V. - Michalec, J. - Polák, J.
Characterization of Individualized Glycemic Excursions during a Standardized Bout of Hypoglycemia-Inducing Exercise and Subsequent Hypoglycemia Treatment—A Pilot Study.
Nutrients. Roč. 13, č. 11 (2021), č. článku 4165. E-ISSN 2072-6643
Institucionální podpora: RVO:67985807
Klíčová slova: type 1 diabetes * exercise * hypoglycemia * insulin therapy * glycemic excursion * hypoglycemia treatment
Obor OECD: Statistics and probability
Impakt faktor: 5.719, rok: 2020
Způsob publikování: Open access
http://dx.doi.org/10.3390/nu13114165
 DOI: 10.3390/nu13114165
The glycemic response to ingested glucose for the treatment of hypoglycemia following exercise in type 1 diabetes patients has never been studied. Therefore, we aimed to characterize glucose dynamics during a standardized bout of hypoglycemia-inducing exercise and the subsequent hypoglycemia treatment with the oral ingestion of glucose. Ten male patients with type 1 diabetes performed a standardized bout of cycling exercise using an electrically braked ergometer at a target heart rate (THR) of 50% of the individual heart rate reserve, determined using the Karvonen equation. Exercise was terminated when hypoglycemia was reached, followed by immediate hypoglycemia treatment with the oral ingestion of 20 g of glucose. Arterialized blood glucose (ABG) levels were monitored at 5 min intervals during exercise and for 60 min during recovery. During exercise, ABG decreased at a mean rate of 0.11 ± 0.03 mmol/L·min−1 (minimum: 0.07, maximum: 0.17 mmol/L·min−1). During recovery, ABG increased at a mean rate of 0.13 ± 0.05 mmol/L·min−1 (minimum: 0.06, maximum: 0.19 mmol/L·min−1). Moreover, 20 g of glucose maintained recovery from hypoglycemia throughout the 60 min postexercise observation window.
Trvalý link: http://hdl.handle.net/11104/0325100

0550068 - ÚI 2022 GB eng A - Abstrakt
De Caterina, R. - De Groot J. R. - Weiss, T. W. - Kelly, P. - Monteiro, P. - Deharo J. C. - De Asmundis, C. - Lopez-De-Sa, E. - Waltenberger, J. - Steffel, J. - Levy, P. - Bakhai, A. - Pecen, Ladislav - Kirchhof, P.
Age-adjusted risk factors are independently associated with an increased risk of ischaemic stroke, transient ischaemic stroke and systemic embolism in the ETNA-AF-Europe registry.
European Heart Journal. Roč. 42, Suppl. 1 (2021), s. 474-474. ISSN 0195-668X. E-ISSN 1522-9645
Trvalý link: http://hdl.handle.net/11104/0325919

0549014 - ÚI 2022 NL eng A - Abstrakt
Bandari, D. K. - Bhagavathula, A. S. - Areman, B. S. - Chhabra, M. - Brkić, J. - Reissigová, Jindra - Fialová, D.
Ageing in developing countries and appropriateness of geriatric prescribing: physicians' knowledge of the explicit criteria of potentially inappropriate medications.
International Journal of Clinical Pharmacy. Roč. 43, č. 3 (2021), s. 804-805. ISSN 2210-7703. E-ISSN 2210-7711
Institucionální podpora: RVO:67985807
Trvalý link: http://hdl.handle.net/11104/0325047

0548995 - ÚI 2022 NL eng A - Abstrakt
Antonenko, O. - Vaculová, G. - Puldová, K. - Halačová, M. - Grešáková, S. - Reissigová, Jindra - Fialová, D.
Appropriateness of hypnosedative drug use in seniors in ambulatory care in the Czech Republic: results from the InoMed and EUROAGEISM H2020 projects.
International Journal of Clinical Pharmacy. Roč. 43, č. 3 (2021), s. 804-804. ISSN 2210-7703. E-ISSN 2210-7711
Institucionální podpora: RVO:67985807
Trvalý link: http://hdl.handle.net/11104/0325028

0549016 - ÚI 2022 NL eng A - Abstrakt
Kummer, I. - Brkić, J. - Lukačišinová, A. - Reissigová, Jindra - Fialová, D.
CVS drug-disease interactions, the prevalence and risk factors in the Czech Republic: results from the InoMed and EUROAGEISM H2020 projects.
International Journal of Clinical Pharmacy. Roč. 43, č. 3 (2021), s. 809-809. ISSN 2210-7703. E-ISSN 2210-7711
Institucionální podpora: RVO:67985807
Trvalý link: http://hdl.handle.net/11104/0325049

0549017 - ÚI 2022 NL eng A - Abstrakt
Kummer, I. - Lukačišinová, A. - Brkić, J. - Příhodová, V. - Reissigová, Jindra - Fialová, D.
Drug-disease interactions' prevalence in nursing homes in the Czech Republic: findings from the InoMed and EU shelter projects.
International Journal of Clinical Pharmacy. Roč. 43, č. 3 (2021), s. 809-809. ISSN 2210-7703. E-ISSN 2210-7711
Institucionální podpora: RVO:67985807
Trvalý link: http://hdl.handle.net/11104/0325051

0549046 - ÚI 2022 US eng A - Abstrakt
Hlinka, Jaroslav - Perez-Cervera, Alberto
Dual role of stimulation and discharges in seizure dynamics is a generic phenomenon.
Epilepsia. Roč. 62, Suppl. 3 (2021), s. 106-106. ISSN 0013-9580. E-ISSN 1528-1167
Institucionální podpora: RVO:67985807
 DOI: 10.1111/epi.17079
Trvalý link: http://hdl.handle.net/11104/0325085

0550757 - ÚI 2022 DE cze A - Abstrakt
Sühring, M. - [Resler, Jaroslav](#) - [Krč, Pavel](#)
Evaluation of surface processes in the PALM model system 6.0 for a real urban environment: a case study in Dejvice, Prague.
Kurzfassungen der Meteorologentagung DACH. Leipzig: Copernicus, 2021.
[DACH 2022: D-A-CH MeteorologieTagung. 21.03.2022-25.03.2022, Leipzig]
Grant CEP: GA KHP(CZ) UH0383; GA TA ČR(CZ) TO01000219
Institucionální podpora: RVO:67985807
Obor OECD: Meteorology and atmospheric sciences
 DOI: 10.5194/dach2022-10

In recent years, the the Large-eddy simulation (LES) model PALM has been rapidly developed its capability to simulate physical processes within urban environments. For example, this includes energy-balance solvers for building and land surfaces, a radiative transfer model to account for multiple reflections and shading, a plant-canopy model to consider the effects of plants on flow (thermo-)dynamics, and a chemistry transport model, as well as nesting capabilities that enable "hot-spot" analysis, to name a few. This contribution provides an evaluation of modeled meteorological as well as ground and wall-surface quantities against dedicated in-situ measurements taken in an urban environment in Dejvice, Prague. Measurements included monitoring of surface temperature and wall heat fluxes. Simulations were performed for multiple days during several summer and winter episodes, characterized by different atmospheric conditions. To consider time-evolving synoptic conditions, boundary conditions were obtained from mesoscale WRF simulations. For the simulated episodes, the resulting temperature and wind speed within street canyons show a realistic representation of the observed state, except that the LES did not adequately capture night-time cooling near the surface in some scenarios. At most of the evaluation points, the simulated surface temperature reproduces the observed surface temperature reasonably well, for both, absolute and daily amplitude values. However, especially for the winter episodes and for modern buildings with multi-layer wall structure, the heat transfer through the walls is not well captured in some cases, leading to discrepancies between the modeled and observed wall-surface temperature. Moreover, we also show that the model performance with respect to the observations strongly depends on the accuracy of the input data. To name a few, this includes e.g. the prescribed initial soil moisture, the given leaf-area densities to account for correct shading, or if a facade is insulated or not. Additionally, we will point out current model limitations, particularly implications accompanied by the step-like topography on the Cartesian grid, or wide glass facades that are not fully represented in terms of radiative processes. With our findings we are able to evaluate the representation of physical processes in PALM, while also pointing out specific shortcomings.
Trvalý link: http://hdl.handle.net/11104/0326059

0549043 - ÚI 2022 US eng A - Abstrakt
[Kopal, Jakub](#) - [Dallmer-Zerbe, Isa](#) - Curot, J. - [Pidnebesna, Anna](#) - Denuelle, M. - Sol, J.-Ch. - Valton, L. - [Hlinka, Jaroslav](#) - Barbeau, E.
Factors influencing the daily evolution of preictal connectivity dynamics in epilepsy.
Epilepsia. Roč. 62, Suppl. 3 (2021), s. 29-29. ISSN 0013-9580. E-ISSN 1528-1167
Institucionální podpora: RVO:67985807
 DOI: 10.1111/epi.17079
Trvalý link: http://hdl.handle.net/11104/0325082

0549865 - ÚI 2022 CZ cze A - Abstrakt
[Geletič, Jan](#) - [Krč, Pavel](#) - [Resler, Jaroslav](#) - Bureš, M. - Řezníček, H. - Belda, M.
Modelování realistického městského mikroklimatu a potenciálních adaptačních opatření.

Konzultační setkání řešitelů vybraných výzkumných projektů v oblasti adaptace hl. m. Prahy na klimatickou změnu. Prezentace.. Praha, 2021.
[Konzultační setkání řešitelů vybraných výzkumných projektů v oblasti adaptace hl. m. Prahy na klimatickou změnu. 02.12.2021-02.12.2021, Praha]

0549012 - ÚI 2022 NL eng A - Abstrakt
Antonenko, O. - Vaculová, G. - Puldová, K. - Halačová, M. - Grešáková, S. - Reissigová, Jindra - Fialová, D.
Patterns of potentially inappropriate hypnosedative use in Czech acute care seniors: outputs from the inomed and EUROAGEISM H2020 projects.
International Journal of Clinical Pharmacy. Roč. 43, č. 3 (2021), s. 804-804. ISSN 2210-7703. E-ISSN 2210-7711

0549003 - ÚI 2022 NL eng A - Abstrakt
Brkić, J. - Okuyan, B. - Kummer, I. - Reissigová, Jindra - Sesto, S. - Capiau, A. - Hadziabdic, M. O. - Tadic, I. - Tachkov, K. - Bobrova, V. - Fialová, D.
Potentially inappropriate prescribing in older adults in central and Eastern Europe: systematic literature review.
International Journal of Clinical Pharmacy. Roč. 43, č. 3 (2021), s. 806-806. ISSN 2210-7703. E-ISSN 2210-7711

0549044 - ÚI 2022 US eng A - Abstrakt
Barbeau, E. - Dallmer-Zerbe, Isa - Jajcay, Nikola - Chvojka, J. - Jiruška, P. - Hlinka, Jaroslav
Predicting excitation and inhibition changes underlying epileptic state transitions in hippocampal rodent slices with and without stimulation.
Epilepsia. Roč. 62, Suppl. 3 (2021), s. 86-86. ISSN 0013-9580. E-ISSN 1528-1167

0549741 - ÚI 2022 NL eng A - Abstrakt
Magátová, A. - Slaná, A. - Reissigová, Jindra - Lukačišinová, A. - Brkić, J. - Fialová, D.
Prescription of sedatives and sedative burden of drug regimens in seniors in Spain and the Czech Republic: results from the INOMED and the EUROAGEISM H2020 projects.
International Journal of Clinical Pharmacy. Roč. 43, č. 6 (2021), s. 1756-1757. ISSN 2210-7703. E-ISSN 2210-7711

0549733 - ÚI 2022 NL eng A - Abstrakt
Brkić, J. - [Reissigová, Jindra](#) - Fialová, D.
Prevalence and correlates of potentially inappropriate medication use in older adults in different settings of care in the Czech Republic.
International Journal of Clinical Pharmacy. Roč. 43, č. 6 (2021), s. 1745-1745. ISSN 2210-7703. E-ISSN 2210-7711
Trvalý link: http://hdl.handle.net/11104/0325660

0549734 - ÚI 2022 NL eng A - Abstrakt
Brkić, J. - [Reissigová, Jindra](#) - Sesto, S. - Altiparmak, O. - Držaić, M. - Kummer, I. - Magátová, A. - Bobrova, V. - Tachkov, K. - Capiau, A.
Prevalence and risk factors of potentially inappropriate medication use in community-residing older adults: preliminary results from the EUROAGEISM H2020 project.
International Journal of Clinical Pharmacy. Roč. 43, č. 6 (2021), s. 1797-1798. ISSN 2210-7703. E-ISSN 2210-7711
Trvalý link: http://hdl.handle.net/11104/0325661

0549743 - ÚI 2022 NL eng A - Abstrakt
Slaná, A. - Magátová, A. - Vaculová, G. - [Reissigová, Jindra](#) - Brkić, J. - Fialová, D.
Prevalence of pain and rationality of use of analgesics in community-residing and acutely hospitalized seniors in the Czech Republic: results from the EUROAGEISM H2020 ESR7 and the INOMED projects.
International Journal of Clinical Pharmacy. Roč. 43, č. 6 (2021), s. 1791-1791. ISSN 2210-7703. E-ISSN 2210-7711
Trvalý link: http://hdl.handle.net/11104/0325666

0549866 - ÚI 2022 RIV CZ cze A - Abstrakt
[Resler, Jaroslav](#)
TURBAN: Modelování kvality ovzduší a tepelného komfortu s rozlišenou turbulencí v městském prostředí.
Konzultační setkání řešitelů vybraných výzkumných projektů v oblasti adaptace hl. m. Prahy na klimatickou změnu. Prezentace.. Praha, 2021.
[Konzultační setkání řešitelů vybraných výzkumných projektů v oblasti adaptace hl. m. Prahy na klimatickou změnu. 02.12.2021-02.12.2021, Praha]
Grant CEP: GA TA ČR(CZ) TO01000219
Grant ostatní: AV ČR(CZ) StrategieAV21/23; AV ČR(CZ) StrategieAV21/3
Program: StrategieAV; StrategieAV
Institucionální podpora: RVO:67985807
Klíčová slova: turbulence * PALM * large-eddy simulation * thermal comfort
Obor OECD: Meteorology and atmospheric sciences
Trvalý link: http://hdl.handle.net/11104/0325762

0549859 - ÚI 2022 US eng V - Výzkumná zpráva
Griffiths, S. - Koch, Ch. - [Secco, Matheus](#)
Deviation probabilities for arithmetic progressions and irregular discrete structures.
Cornell University, 2021. 32 s. arXiv.org e-Print archive, arXiv:2012.09280 [math.CO].
Grant CEP: GA ČR(CZ) GJ20-27757Y
Institucionální podpora: RVO:67985807
https://arxiv.org/abs/2012.09280
Trvalý link: http://hdl.handle.net/11104/0325755

0549835 - ÚI 2022 US eng V - Výzkumná zpráva
Blažej, V. - Opler, M. - Šileikis, Matas - Valtr, P.
Non-homotopic Loops with a Bounded Number of Pairwise Intersections.
Cornell University, 2021. 27 s. arXiv.org e-Print archive, arXiv:2108.13953v1 [math.CO].
Grant CEP: GA ČR(CZ) GJ20-27757Y
Institucionální podpora: RVO:67985807
https://arxiv.org/abs/2108.13953
Trvalý link: http://hdl.handle.net/11104/0325731

0549609 - ÚI 2022 DE eng V - Výzkumná zpráva
Krč, Pavel - Resler, Jaroslav - Sühring, M. - Schubert, S. - Salim, M. - Fuka, V.
Radiative Transfer Model 3.0 integrated into the PALM model system 6.0.
Mnichov: European Geosciences Union, 2021. 57 s. Geoscientific Model Development Discussions,
gmd-2020-168. *Geoscientific Model Development*. -, Accepted for review Aug 2020 (2021). ISSN
1991-959X. E-ISSN 1991-9603
Grant CEP: GA KHP(CZ) UH0383
Grant ostatní: Ga MŠk(CZ) LM2015070
Institucionální podpora: RVO:67985807
Obor OECD: Meteorology and atmospheric sciences
http://dx.doi.org/10.5194/gmd-2020-168
 DOI: 10.5194/gmd-2020-168

The Radiative Transfer Model (RTM) is an explicitly resolved three-dimensional multi-reflection
radiation model integrated into the PALM modelling system. It is responsible for modelling complex
radiative interactions within the urban canopy. It represents a key component in modelling energy
transfer inside the urban layer and consequently PALM's ability to provide explicit simulations of the
urban canopy at metre-scale resolution. This paper presents RTM version 3.0, which is integrated into
the PALM modelling system version 6.0. This version of RTM has been substantially improved over
previous versions. A more realistic representation is enabled by the newly simulated processes, e.g.
the interaction of longwave radiation with the plant canopy, evapotranspiration and latent heat flux,
calculation of mean radiant temperature, and bidirectional interaction with the radiation forcing model.
The new version also features novel discretization schemes and algorithms, namely the angular
discretization and the azimuthal ray tracing, which offer significantly improved scalability and
computational efficiency, enabling larger parallel simulations. It has been successfully tested on a
realistic urban scenario with a horizontal size of over 6 million grid points using 8192 parallel
processes.
Trvalý link: http://hdl.handle.net/11104/0325581
Vědecká data v ASEP:
Sensitivity Analysis of the PALM Model System 6.0 in the Urban Environment

0549836 - ÚI 2022 US eng V - Výzkumná zpráva
Klimošová, T. - Reiher, Ch. - Rucinski, A. - Šileikis, Matas
Sandwiching biregular random graphs.
Cornell University, 2021. 45 s. arXiv.org e-Print archive, arXiv:2010.15751 [math.CO].
Grant CEP: GA ČR(CZ) GJ20-27757Y
Institucionální podpora: RVO:67985807
https://arxiv.org/abs/2010.15751
Trvalý link: http://hdl.handle.net/11104/0325732

Belda, M. - Resler, Jaroslav - Geletič, Jan - Krč, Pavel - Maronga, B. - Sühring, M. - Kurppa, M. - Kanani-Sühring, F. - Fuka, V. - Eben, Kryštof - Benešová, N. - Auvinen, M.

Sensitivity analysis of the PALM model system 6.0 in the urban environment.

The PALM 6.0 model system has been rapidly developed in the recent years with respect to its capability to simulate physical processes within urban environments. In this regard, it includes e.g. energy-balance solvers for building and land surfaces, a radiative transfer model to account for multiple reflections and shading, as well as a plant-canopy model to consider the effects of plants on the (thermo)dynamics of the flow. This study provides a thorough evaluation of modelled meteorological, air chemistry and wall-surface quantities against dedicated in-situ measurements taken in an urban environment in Prague, Dejvice, Czech Republic. Measurements included e.g. monitoring of air quality and meteorology in street canyons, surface temperature scanning with infrared camera and monitoring of wall heat fluxes. Large-eddy simulations (LES) for multiple days within two summer and three winter episodes that are characterized by different atmospheric conditions were performed with the PALM model driven by boundary conditions obtained from a mesoscale model. For the simulated episodes, the resulting temperature, wind speed and concentrations of chemical compounds within street canyons agreed well with the observations, except the LES did not adequately capture nighttime cooling near the surface at certain meteorological conditions. In some situations, less turbulent mixing was modelled resulting in higher near-surface concentrations. At most of the surface evaluation points the simulated wall-surface temperature agreed fairly well with the observed one regarding its absolute value as well as daily amplitude. However, especially for the winter episodes and for modern buildings with multi-layer walls, the heat transfer through the wall is partly not well captured leading to discrepancies between the modelled and observed wall-surface temperature. Furthermore, we show that model results depend on the accuracy of the input data, particularly the temperatures of surfaces affected by nearby trees strongly depend on the spatial distribution of the leaf area density, land-surface temperatures at grass surfaces strongly depend on the initial soil moisture, or wall-surface temperatures depend on the correct prescription of wall material parameters, though these parameters are often not available with sufficient accuracy. Moreover, we also point out current model limitations, here we particularly focus on implications with respect to the discrete representation of topography on a Cartesian grid, complex heterogeneous facades, as well as glass facades that are not well represented in terms of radiative processes. With these findings presented, we aim to validate the representation of physical processes in PALM as well as to point out specific shortcomings. This will help to build a baseline for future developments of the model and for improvements of simulations of physical processes in an urban environment.
Trvalý link: http://hdl.handle.net/11104/0325586

Vědecká data v ASEP:

Sensitivity Analysis of the PALM Model System 6.0 in the Urban Environment