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	analysis. In the analysis, finite element program PLAXIS and limit equilibrium program SLIDE were used and critical sections are considered. The parameters used in the analysis were obtained from laboratory and site investigations. In the study, the effect of the model and failure type on the slope stability were investigated. It has been found that soil model type and failure mechanism are main parameters in the stability analysis and there is a good agreement between finite element and limit equilibrium methods. **Keywords: Slope stability, finite element method, limit equilibrum analysis.**
Costel Bumbac **GICICRST1806111**	**Experimental Studies On Microbial Populations Diversity In Continuous Flow Aerobic Granular Sludge Systems** **Costel Bumbac** **Department of Environmental Technologies and Technology Transfer, National Research and Development Institute for Industrial Ecology** **Elena Elisabeta Manea** **Department of Environmental Technologies and Technology Transfer, National Research and Development Institute for Industrial Ecology** **Abstract** **Recent trends in wastewater treatment research have focused, under the urge of improving wastewater treatment performances and cost-efficiency, on adapting the aerobic granular sludge technology to continuous flow operation regime.** **In our study, we followed both the evolution of wastewater treatment performance in lab scale continuous flow bioreactors (in different configurations) and the comparative evolution of the microbial populations of the aerobic granular sludge. The aerobic sludge granules were continuously monitored during reactor start-up, granules formation and steady state conditions, in terms of microbial diversity and morphology by DNA fingerprinting using qPCR amplification and respectively, confocal laser scanning microscopy and scanning electron microscopy. The experimental study focused on nutrient removal performances evaluation and the qualitative and quantitative assessment of specific species or functional genes with increased influence on the performance of biological processes involved in wastewater treatment, namely nitrification, denitrification and phosphorus removal.** **Keywords: aerobic granular sludge, microbial diversity, wastewater treatment,**
Elena Elisabeta Manea **GICICRST1806112**	**Aerobic granular sludge reactors flow optimization towards continuous flow systems** **Elena Elisabeta Manea** **National Research and Developpment for Industrial Ecology –NRDI ECOIND, 71-73 Podu Dambovitei Street, Sector 6, Bucharest, Romania** **Costel Bumbac** **National Research and Developpment for Industrial Ecology –NRDI ECOIND, 71-73 Podu Dambovitei Street, Sector 6, Bucharest, Romania** **Abstract** **Aerobic granular sludge has recently gained the reputation of a complete biological system that allows different process conditions to be obtained (aerobic, anoxic, anaerobic) in the same reactor, thus allowing microorganisms in its structure to be both capable of organic matter removal, nitrification, denitrification and phosphorus removal. Aerobic granular sludge is currently implemented in full scale wastewater treatment**

	plants only for sequential batch reactors, extensive research being currently carried out in roder to implement the system in continuous flow reactors. **Four different continuous flow aerobic granular sludge configurations were developped, tested and optimized and were monitored in order to evaluate the evolution of granular aerobic sludge under continuous feed conditions. The bioreactor hydraulics characteristics were continuously improved on theoretical and experimental observations. The experimental findings have guided the possibilities of improving bioreactor flow, aeration and homogenization systems in order to: reduce the dead zones (reduced velocities near the tank corners), avoid aerobic granules accumulation near the the tank's bottom and increase the shear forces (essential condition of aerobic granular sludge stability).** **The research is driven by the need of increasing existing WWTPs efficiencies in terms of combined organic loading and nutrients removal, with as little as possible adjustments to the existing tank's physical forms.** **Key words: wastewater treatment, aerobic granular sludge**
Minaeva Julia Ivanovna **GICICRST1806113**	**Fuzzy mathematics in conditions of limited possibilities the membership function assigning** **Minaev Yuryi Mykolayovych** **D. Sc. National Aviation University, Institute of Computer Information Technologies, Ukraine** **Filimonova Oksana Yuryevna** **Ph. D., Kyiv National University of Civil Engineering and Architecture, Building department, Ukraine** **Minaeva Julia Ivanovna** **Ph. D., Kyiv National University of Civil Engineering and Architecture, Building department, Ukraine** **Filimonov Georgiy Oleksandrovych** **Kyiv National University of Civil Engineering and Architecture, Department of automation and information technology, Ukraine** **Abstract** **This article considers issues of the solution problems under uncertainty conditions, reducible to fuzzy sets,** $\tilde{x} \triangleq \{x/\ \mu^x\}$ $x \in X = \{x\}$, $\mu^x \rightarrow [0,1]$; **X universal set,** μ^x **- membership functions, provided limited possibilities for assigning the membership function.** **Explored the possibility of forming ordered subsets pairs on the basis of identifying hidden knowledge contained in the universal set, and applying standard algorithms of fuzzy mathematics to the computed subset.** **Methodology: the identification of hidden knowledge based on the a universal set fuzzification by the influence of the fuzzy operator (special matrix) on the vector of the universal set.** **In article purposed formation on the basis of the universal set of 2-D tensors (special (Teplitz or Hankel) matrices): {x}→{** T^x, H^x**},** T^x **= toeplitz(x),** H^x**= hankel(x) respectively, singular 2-D tensors decomposition** T^x **(or** H^x**).** **In the article is proposed new approch for solving problems in conditions of uncertainty by forming a new object - ordered pairs subsets, analogous to heuristically formed fuzzy sets. The newly created object makes possible to use the fuzzy mathematics principles, methods and algorithms to extend the class of problems solved under uncertainty.** **The most rational use of the developed methodology is the objects which**