



UAV-BASED MONITORING AND MODELING OF ENVIRONMENTAL FACTORS

NARD&MSU supported research project #20.80009.7007.05

AUTHORS: Veaceslav SPRINCEAN, Adrian PALADI, Vasili ANDRUH, Anton DANICI, Petru LOZOVANU and Florentin PALADI

APPLICATION FIELD: Environmental monitoring, Unmanned Aerial Vehicles (UAV), Computer modeling and forecasting of the impact of biotic and abiotic factors

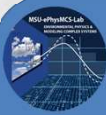
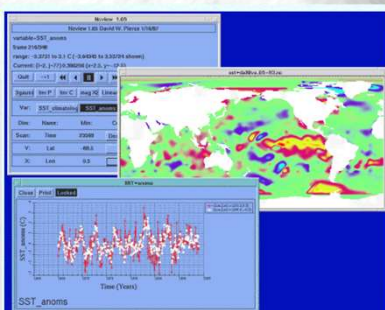
AIM: NARD&MSU supported applied research project "Monitor3D" (#20.80009.7007.05, 2020-2023) is focused on the development of civil applications based on UAV with high potential in environmental monitoring and pollution control in the real-time regime, as well as systemic analysis and interpretation of the monitoring results. Development of the related applications for computational modeling and forecasting of the environmental factors and the health impact of air pollution, in connection with modern optical technologies and different types of UAV-based sensors for the real-time precise measurements, will facilitate the analysis and interpretation of the monitoring results.

Office for Education for Drones



GEOS-Chem

Advance understanding of human and natural influences on the environment through a comprehensive, state-of-the-science, readily accessible global model of atmospheric composition.



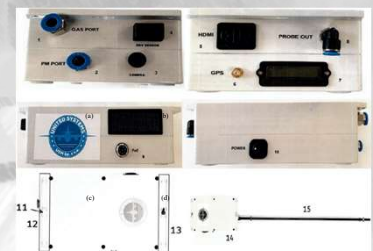
Advanced physical technologies with the UVS application in monitoring and modelling of environmental factors (Monitor3D, 2020-2023)

Main NOVELTY of the project is the symbiosis of advanced physical technologies developed in the research laboratories of the Moldova State University (MSU/USM) in environmental factors monitoring with the application of drones, and the use of these exact data obtained in the real-time regime for modeling the impact of biotic and abiotic factors on the environment and society with the possibility of forecasting dangerous natural hazards and health effects of the PM-pollution.

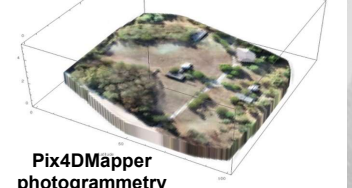
Monitoring, modeling and forecasting of the environmental factors:

- Application of drones in the air quality monitoring with dust and gas sensors.
- Collection of current and historical metrological data.
- Use of drones to investigate remotely the health of plants, based on the excitation of fluorescence spectra under the influence of laser radiation.
- Determination of the exact location of environmental pollution sources, composition and concentration of gases emitted into the atmosphere, time and frequency of these emissions.
- Development of the related computer modeling software for analysis and interpretation of the monitoring results, as well as for forecasting environmental conditions.
- Provide with effective and efficient instruments to transfer new knowledge to professionals through the Program of Professional Continued Education "Educational for Drone", developed in the Office for Education for Drones at the Moldova State University, <http://moodle.usm.md/moodle/course/index.php?categoryid=208>

D800 X-8 drone platform and measuring station "SOWA"

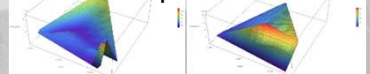


MSU lab "Environmental Metrology and Astronomy" in Lozova, Strasen



Pix4DMapper photogrammetry

Concentration of PM₁₀ and PM_{2.5} air pollution



ADVANTAGES: Application of the advanced physical and computational techniques for solving the problems in environmental monitoring and pollution control

IMPLEMENTATION STAGE: Ongoing applied research project. WEB: <http://ephysimlab.usm.md>