

Noise Monitoring and Acoustic Mapping at Motorcycle Racing

CASE STUDY: Precise Environmental Noise Monitoring and Acoustic Mapping with SV 307A and SvanNET

Challenge:

Ensuring Reliable and Representative Data for Acoustic Mapping

Measurement Operator:

Team from the Silesian University of Technology (Politechnika Śląska) - Faculty of Civil Engineering - under the supervision of Dr. Eng. Rafał Żuchowski

Measurement Equipment:

- SV 307A Class 1 Noise Monitoring Station
- SvanNET - Automatic Monitoring Services - Cloud platform for remote access, management, and data transfer

Noise Monitoring Case Study

Motorcycle racing events generate highly variable and impulsive noise that frequently exceeds 120 dB, significantly affecting the acoustic climate of the surrounding environment. At Autodrom Bitgoraj, a comprehensive environmental noise monitoring campaign was carried out using the SVANTEK **SV 307A** Noise Monitoring Station integrated with the **SvanNET** cloud platform. The real-time acoustic data collected during racing sessions became the foundation for developing detailed acoustic maps that illustrate how race-related noise propagates across the nearby area.



The monitoring and analysis were conducted by Dr. Eng. Rafał Żuchnik from the Silesian University of Technology, an expert in environmental acoustics, noise measurement methodologies, and sound propagation modeling. His experience ensured correct calibration procedures, reliable measurement configuration, thorough validation of long-term datasets, and compatibility of the collected material with acoustic mapping software.

Racing noise presents unique measurement challenges due to its dynamic nature. Sound levels change rapidly depending on acceleration, engine load, gear shifting, cornering maneuvers, and the geometry of the track. Weather conditions also influence propagation. Capturing this complexity required continuous, uninterrupted monitoring and equipment capable of detecting impulsive noise peaks with high temporal resolution. The priority was to obtain stable, representative, and validated data suitable for acoustic model calibration and for illustrating the distribution of sound exposure across the racetrack surroundings.

The **SV 307A** Noise Monitoring Station provided an all-in-one solution designed for long-term outdoor operation. Its Class 1 microphone, weatherproof housing, integrated diagnostics, LTE modem, and GPS module ensured precise and reliable monitoring even in variable meteorological conditions. The **SvanNET** platform supported the measurement campaign by enabling remote supervision, secure data archiving, convenient access to real-time noise levels and spectra, and efficient validation of monitoring sessions. Together, these technologies ensured consistent data quality and minimized the risk of measurement gaps.

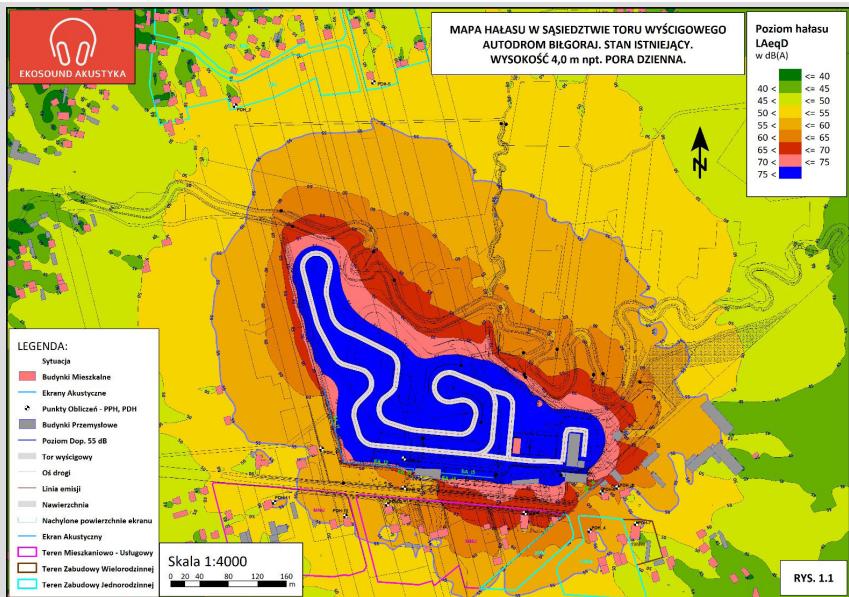


“Accurate acoustic maps require precise and continuous measurement data.”

The combination of SV 307A and SvanNET ensures high-quality datasets essential for environmental modeling, regulatory compliance, and the effective planning of noise protection measures.”

Rafał Żuchowski,
Silesian University of Technology

According to Dr. Eng. Rafał Żuchnik, accurate acoustic maps can only be created using precise and continuous measurement data, and the combination of **SV 307A** and **SvanNET** guarantees datasets suitable for environmental modeling, regulatory compliance, and planning effective noise mitigation strategies.



The results of the project confirmed the value of this integrated approach. Continuous Class 1 monitoring ensured complete coverage of all race sessions, and real-time supervision through **SvanNET** allowed for immediate validation of measurement quality. The collected data served as the basis for producing detailed acoustic maps that visualize the spatial distribution of noise around the racetrack. These maps not only revealed how sound propagated under race conditions but also demonstrated the usefulness of advanced monitoring systems in scientific analysis, environmental protection, and decision-making related to noise management.

Conclusion

The Autodrom Biłgoraj case study shows that combining high-accuracy measurement instruments with cloud-based supervision tools enables precise assessment of dynamic noise sources. With **SV 307A** and **SvanNET**, environmental noise monitoring becomes an effective and reliable method for understanding acoustic impact, supporting regulatory processes, and improving noise management strategies for both scientific and practical applications.



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