**NUMER IDENTYFIKACYJNY // CONTRIBUTION ID**

**Symulacje numeryczne transportu gazów śladowych na terenach górskich na przykładzie Tatr // Numerical simulations of trace gas transport in mountainous areas, based on the example of the Tatra Mountains**

**Autor // Author:** Mirosław Zimnoch1, Adrian Góra1, Artur Piórko1, Alina Jasek-Kamińska1,2, Michał Gałkowski1,3

1 Akademia Górniczo-Hutnicza im. Stanisława Staszica w Krakowie, Wydział Fizyki i Informatyki Stosowanej,  *// AGH University of Krakow, Faculty of Phycics and Applied Computer Science, Krakow, Poland*

2 Instytut Meteorologii i Gospodarki Wodnej – Państwowy Instytut Badawczy,  *// Institute of Meteorology and Water Management – National Research Institute, Krakow, Poland*

3 *Max Planck Institute for Biogeochemistry, Department of Biogeochemical Signals, Jena, Germany*

**Korespondujący autor // Corresponding Author: zimnoch**@agh.edu.pl

Accurate measurements of atmospheric greenhouse gas (GHG) molar factions like CO2 and CH4 at background locations is crucial for the performance of inversion modeling systems being widely used in the top-down verification of greenhouse gas emissions [1]. AGH-University of Krakow operates KASLAB station on Kasprowy Wierch for monitoring of those gases in the eastern Europe since 1994. The location in Tatra Mountains exposes the station to the impact of nearby towns emissions caused by local effects (such as mountain breezes). This work presents the study of local transport patterns in Tatras performed using WRF-Chem numerical atmospheric simulation model[2]. The analysis include the evaluation of model performance based on the comparison of simulated basic meteorological parameters (temperature, relative humidity, wind speed) with the observations available for this region as well as the analysis of GHG’s transport patterns during the typical synoptic situations for this area and observed variability of CO2 and CH4 at two locations (Kasprowy Wierch and Myślenickie Turnie) during the simulated events.

**References**

[1] Cui, Yu Yan et al. 2015 “Top-down estimate of methane emissions in California using a mesoscale inverse modeling technique: The South Coast Air Basin”. In: *Journal of Geophysical Research-Atmospheres* **120**, p. 6698-6711, https://doi.org/10.1002/2014JD023002

[2] Grell, G. A., Peckham, S. E., Schmitz, R., McKeen, S. A., Frost, G., Skamarock, W. C., and Eder, B.: 2005, “Fully coupled “online” chemistry within the WRF model”, In: *Atmospheric Environment*, **39**, 6957–6975, https://doi.org/10.1016/j.atmosenv.2005.04.027