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ASSESS THE IMPACT OF DIFFERENT EMISSION SCENARIOS FOR FUTURE AIR QUALITY AND CROP YIELDS IN BULGARIA USING TM5-FASST TOOL

Reneta Dimitrova [1,2] and Svetoslav Botev [1]

[1]Department of Meteorology and Geophysics, Sofia University "St. Kl. Ohridski", Sofia, Bulgaria
[2] Department of Geophysics, National Institute of Geophysics, Geodesy, and Geography, Bulgarian Academy of Sciences

Abstract: TM5-FASST tool is new user-friendly web-based version of the global Air Quality Source-Receptor Model (AQ-SRM) TM5-FASST, developed by EU Joint Research Centre (JRC) in order to address the need for swift and easy evaluation of global and regional air pollution emission scenarios and their impacts on human health and ecosystems. This tool were applied for Bulgaria region and several tasks were resolved.

EDGARv4.3.1 (Emissions Database for Global Atmospheric Research version v4.3.1; http://edgar.jrc.ec.europa.eu/index.php) was used as the reference inventory of anthropogenic emissions, providing global grid maps of sector-specific historical emission data from 1970 to 2010 for main gaseous pollutants and particulate. The impact of different emission sectors - energy, industry, transport, residential, waste, solvents, agriculture, natural, aviation and shipping, were estimated after 20% emission reduction of the base 2000 emissions. Difference in concentration of four pollutants - particulate (PM2:5), black carbon (BC), ozone (O3) and nitrogen oxides (NOx) and were calculated and contribution of local and imported pollution were estimated for Bulgaria.

Crop Loss for Bulgaria for 4 major crops: wheat, maize, rice, soybean, were estimated for different RCP future scenarios for 2030, 2050 and 2100 years. Two metrics AOT40 (European approach) - accumulated hourly ozone above 40ppbv threshold, and M7 (M12) (US approach) growing-season mean of 7hr (12hr) daytime ozone have been applied to evaluate against exposure to ozone.

Key words: *Decision support systems, Air pollution management, TM5-FASST tool.*