# Assessing the effectiveness of RegCM4 regional climate model in simulating the aerosol optical depth patterns over the region of Eastern Mediterranean

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In this work, the ability of the regional climate model RegCM4 to simulate the aerosol optical depth (AOD) patterns over the region of Eastern Mediterranean is assessed. Three separate runs were implemented within the framework of the QUADIEEMS project for the time period 2000-2010 at a horizontal resolution of 50km covering the region of Europe. ERA-interim data were used as lateral boundary conditions while the model was driven by emissions from CMIP5. In the first case, the total of the aerosol types that RegCM4 accounts for were included (sulfate, black carbon, sea salt, dust), while in the other two cases only anthropogenic and dust particles were taken into account, respectively. The total AOD patterns were compared against level-2 satellite observations from MODIS TERRA and AQUA and ground-based measurements from 12 AERONET sites located in the region. In addition, the RegCM4 anthropogenic and dust AOD patterns were compared against the anthropogenic and dust component of MODIS AOD which was calculated using a combination of various satellite, model and reanalysis products. Our results indicate a significant underestimation of the anthropogenic AOD, while, on the contrary, the dust AOD fields are simulated in a more efficient way. The QUADIEEMS project is co-financed by the European Social Fund (ESF) and national resources under the operational programme Education and Lifelong Learning (EdLL) within the framework of the Action "Supporting Postdoctoral Researchers".