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TELECONNECTION INDICES' EFFECT ON URBAN POLLUTANTS IN ISTANBUL

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Since the atmospheric circulation patterns that were effected by teleconnection indices influence the meteorological conditions throughout Europe, and the mega cities face serious air quality issues; it is important to research the antropogenic impacts on atmospheric composition in these cities. High concentrations of nitric oxides, sulfur dioxide, particulate matter, carbonmonoxide, ozone and hydrocarbons can be observed in the megacities due to anticyclonic weather conditions. As one of the ancient megacities in the world, Istanbul has a population of 13.5 million, roughly. Since the city is situated between the Black Sea from the North and the Sea of Marmara from the South and the Bosphorus channel divides the city to two continents; Asia and Europe on the direction of NNE/SSW, the weather conditions in Istanbul are mainly the result of interaction of large and local scale circulation systems with the environment and topography. In order to understand the relationship between atmospheric circulation patterns, as represented by teleconnection indices; Arctic Oscillation (AO), North Atlantic Oscillation (NAO), Multivariate El Niño-Southern Oscillation Index (MEI) and selected urban air pollutants; PM₁₀, SO₂, NO and NO₂ in Istanbul for the period of 2005-2012 were examined. Hourly concentrations of PM₁₀, SO₂, NO and NO₂ measured at ten locations for winter and summer with varying parameters like air pressure, temperature, wind speed and direction from the urban atmosphere of Istanbul were used in relation to teleconnections. Correlations were run for levels of PM₁₀, SO₂, NO and NO₂; and AO, NAO and MEI . And as a result the trends for the teleconnection indices were examined and the potential of the effects on urban air pollution were assessed.

Keywords: Teleconnection indices, urban pollutants