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NONLINEAR SET MEMBERSHIP FORECAST OF URBAN OZONE PEAKS

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Abstract - In the paper a Nonlinear Set Membership (NSM) prediction method is applied to forecast tropospheric pollution. The NSM method does not require the choice of the functional form of the model used for prediction but only assumes a regularity condition on the regression function defining the model. In this way, the complexity/accuracy problems deriving from the proper choice of a suitable parametrization are circumvented. Here the NSM method is used to forecast the tropospheric ozone concentration in Brescia, a highly populated and industrialized area in Northern Italy. Purpose of this application is to aid local Authorities in decision-making policies for secondary pollution control and prevention. The NSM method is compared to other modelling approaches such as Neural Network, NeuroFuzzy, ciclostationary autoregressive and k-nearest neighbor classification. Model performances are assessed through comparison of indices and statistical indicators suggested by the European Environment Agency.