



## **Low temperature hysteresis properties of traffic-related PM in Rome: a clue to estimate the content of superparamagnetic particles**

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Following the recent studies on the hysteresis characterization of the magnetic airborne particulate matter (PM) in Rome, Italy (e.g. Sagnotti et. al, 2009), we carried out a new set of analyses particularly devoted to the identification of the superparamagnetic (SP) fraction and to the evaluation of the contribution of ultrafine particles to the overall magnetic assemblage of traffic-related PM matter. Low temperature (LT) hysteresis cycles and isothermal remanence acquisition and remagnetization curves have been measured on powders collected from disk brakes, diesel and gasoline exhaust pipes of circulating vehicles and from samples of *Quercus ilex* leaves collected from the sidewalk of high-traffic roads.

The presence and the concentration of SP particles has been estimated observing how the typical magnetic parameters and hysteresis ratios measured in the analyzed PM samples change in a range of temperature from 10K to room temperature. The LT magnetic properties of the powder samples collected from the different potential sources in circulating vehicles have been compared to those measured on the *Quercus ilex* leaf samples. The data provide new experimental constrains to quantify the influence of SP particles on the overall magnetic properties of the traffic-related airborne PM and to identify their main sources in circulating vehicles.

Sagnotti, L., J. Taddeucci, A. Winkler, and A. Cavallo (2009), Compositional, morphological, and hysteresis characterization of magnetic airborne particulate matter in Rome, Italy, *Geochem. Geophys. Geosyst.*, 10, Q08Z06, doi:10.1029/2009GC002563.