



## Magnetic properties of PM in indoor/outdoor domestic environments

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The finer fraction of the particulate matter (PM) is the most harmful health wise, as it has more capacity to reach deeper parts of the respiratory system. Among other constituents, PM also contains iron oxides, allowing for the use of magnetic methods in its investigation as proxies for the whole of PM. Those methods present advantages in comparison to traditional ones, being quick, cost effective and sensible to investigate iron oxides among PM.

To better understand the risks related to PM exposition in the domestic context, the assessment of magnetic parameters may be used in outdoor and indoor environments, giving us information on the concentration of iron oxides (and consequently, PM) and its dispersion from one environment to the other.

We developed a citizen sciences experiment in the city of Toulouse, France. Tree barks were used as bio-collectors. Garlands composed of tree bark pieces were distributed to the population in May-2019, and placed in both indoors and outdoors of flats and homes to capture PM. They were retrieved after one year. Measurement of magnetic susceptibility, ARM, SIRM, S -ratio and estimation of superparamagnetic concentration were performed. A total of 86 bio-collectors kits were successfully analyzed. The preliminary results indicate a higher concentration of iron oxides outdoors, with a mean difference between outdoor and indoor measurements of  $6.58 \times 10^{-9} \text{m}^3/\text{kg}$  and  $1.38 \times 10^{-5} \text{Am}^2/\text{kg}$  in susceptibility and SIRM respectively. The concentration of the SP fraction also follows this trend of higher outdoor values. The magnetic mineralogy is mostly dominated by low coercivity magnetite-like carriers.