

## **Complex refractive index calculation for sub-micron aerosol using a simulating annealing approach**

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Besides the knowledge of size distribution and chemical composition of the atmospheric particles, the complex refractive index is also an important component to characterize the microphysic properties of the aerosols. Since the refractive index can not be measured directly, its determination involves experimental data and numerical analysis based on Mie theory.

Formal inverse theory has been applied by several authors to obtain a single refractive index for the entire day. However, metaheuristic schemes, such as Genetic Algorithms and Simulated Annealing (SA), have been applied recently on this field due to their capacity to solve highly nonlinear problems.

In this work an inversion method based on SA and Mie theory was developed in order to estimate the hourly complex refractive index from ambient aerosols from Tula region at Hidalgo State in Mexico. Such a method was applied to light scattering and particle size distribution experimental data, obtained during the MILAGRO field campaign in 2006, using a Model 3563 TSI Integrating Nephelometer and a Model 3936 TSI SMPS, respectively.

Preliminary results show important differences on refractive index values when compared against previous results obtained from collected particles in winter 2004 at highly urbanized region (La Merced site in Mexico City).