

## ABSTRACT

This research consists in the solution of the inverse problem of radiative transfer for a participating media (emitting, absorbing and/or scattering) homogeneous one-dimensional in one layer, using the combination of artificial neural network (ANN), with optimization techniques.

The output of the ANN, properly trained presents the values of the radiative properties  $[w, \tau_0, p_1 \text{ e } p_2]$  that are optimized through the following techniques: Particle Collision Algorithm (PCA), Genetic Algorithm (GA), Greedy Randomized Adaptive Search Procedure (GRASP) and Tabu Search (TS).

The data used in the training are synthetics, generated through the direct problem without the introduction of noise.

The results obtained by the (ANN) alone, presents an average percentage error minor than 1,64%, what it would be satisfying, however, for the treatment using the four techniques of optimization aforementioned, the results have become even better with percentage errors minor than 0,03%, especially when the optimization is made by the GA.

Keywords: Inverse Problem, Radiative Transfer, Neural Network, PCA, Tabu Search, GRASP, Genetic Algorithms.