Some remarks for users

The code producing data for the database has been written in two languages – Pascal and Fortran. The program files are called **NeuroCluster.pas** and **NeuroCluster.for**, respectively. The code reads some weights form the files **ww_11x**, **ww_12x** (where **x=pas** for Pascal and **x=for** for Fortran), some numbers from a file **data** and output results in the file **a_11_12.txt**.

The files **ww_11x** and **ww_12x** (e.g., **ww_11pas, ww_11for**, etc.) contain the weights of the artificial neural network (the two layer perceptron) which are used to calculate the expansion coefficients a_{11} and a_{12} of the scattering matrix elements S_{11} and S_{12} (contact the authors (link) for a code that calculates these weight for different parameter values).

The file **data** sets the input vector of the perceptron and the range of the scattering angles within which the calculations have to be performed. Since the perceptron has been so far trained for the fractal dimension $D = 3$, the density $\rho = 8$ and the size parameter of cluster's grain $x = 1.5$, the free parameters in the input vector are the real and imaginary parts of refractive index m and the number of grains in the cluster N. The structure of the input file **data** is as follows:

theta_min	*theta_max*	*del_theta*
0	180	2
Re(m)	*Im(m)*	*N*
1.70	0.001	10

Here, as it has been mentioned in the Description, *theta_min, theta_max, del_theta* (all in degree) are the minimum and maximum values, and the step of change of the scattering angles at which the scattering matrix elements are calculated. *Re(m)* ($1.4 < \mathrm{Re(m)} < 1.71$) and *Im(m)* ($0.001 < \mathrm{Im(m)} < 0.1$) are the real and imaginary parts of the complex refractive index of cluster's grain, N ($\mathrm{N} < 50$) is the number of grains in the cluster.

Note that the files **ww_11x, ww_12x** (e.g., **ww_11pas, ww_12pas**) and **data** must be in the same directory as the program **NeuroCluster.pas** (or **NeuroCluster.for**)!

The output file **a_11_12.txt** contains the expansion coefficients of the scattering matrix element a_{11} and a_{21} in series of the generalized spherical function as well as the angular dependencies of the scattering matrix elements S_{11}, S_{21} and the degree of linear polarization P ($P = -S_{21}/S_{11}$). The matrix elements are normalized in the way that integration of S_{11} over all scattering angle gives the scattering effeciency Q_{sca}.