

We study the optical properties of nonfractal random gas of particles, fractal cluster-cluster aggregates and nanostructured self-affine thin films. We use the coupled-dipole equations to describe the interaction of the external electromagnetic wave with nanoparticles. We find that in the self-affine thin films the particle size dispersion can be invoked to tailor the spectrum of local field enhancement. In the case of fractal clusters, the bandwidth of the spectrum decreases as the particle size dispersion increases. The maxima and minima of the spectrum vary, shift, and even disappear but in the case of nonfractal clusters, the size dispersion has no influence on the overall shape of the spectrum.