

The Local Density of States in Finite Size Photonic Structures, Small Particles Approach

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We study the local density of states in finite size photonic structures by considering them as made of small particles. Dividing the structure into segments with a size small compared to the incident wavelength, one can apply methods suitable for the wave scattering by small particles. This local perturbation method correctly reproduces the lowest frequency resonance of the small particles and it fulfills the optical theorem (energy conservation). The small particles can be given prescribed positions in space: for instance random, or periodic as in a photonic crystal. By using the local perturbation method, we have calculated the local density of states for one, two, and three dimensional finite size photonic structures.