

High NA Fourier space imaging of planar photonic crystals

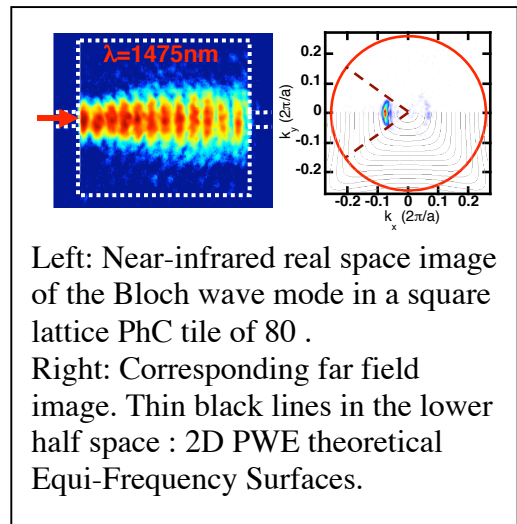
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We report on the investigation with far field optics of the Bloch modes propagation inside PhC structures. An end-fire set-up, used to measure the PhCs transmission, was coupled to a high NA imaging set-up allowing the simultaneous imaging of the real and Fourier space as shown in the figure.

With this far field optics technique we are able to retrieve fundamental optical properties of PhC structures, such as the light path and the dispersion curves above and below the light cone, the equi-frequency surfaces and the reflection and transmission, in a single step and without numerical post-processing. This technique is extremely valuable for the development of new photonic crystal devices and we demonstrate that it allows us to break the light cone limit.



Left: Near-infrared real space image of the Bloch wave mode in a square lattice PhC tile of 80 .

Right: Corresponding far field image. Thin black lines in the lower half space : 2D PWE theoretical Equi-Frequency Surfaces.