Abstract Submitted
for the DAMOP13 Meeting of
The American Physical Society

Light propagation in non-linear and disordered photo-induced lattices JULIEN ARMIJO, DIEGO GUZMAN, CAMILO CANTILLANO, DANY LOPEZ, LUIS MORALES, Departamento de Fisica, Center for Optics and Photonics, Facultad de Ciencias, Universidad de Chile, Santiago, Chile, SEBASTIAN ETCHEVERRY, Center for Optics and Photonics, Universidad de Concepcion, 4016, Concepcion, Chile, RODRIGO VICENCIO, Departamento de Fisica, Center for Optics and Photonics, Facultad de Ciencias, Universidad de Chile, Santiago, Chile —
We present the first experimental results of our new non-linear optics lab at Universidad de Chile. We use photorefractive SBN crystals to photoinduce lattices of various geometries (square, hexagonal, Kagome, disordered, etc.), using a 532nm cw laser and spatial light modulators in real and Fourier space. In regular lattices, linear propagation of a focussed probe wave results in typical discrete diffraction patterns, with intense outer lobes expanding ballistically. Beyond the first Brillouin zone and the Bragg-reflection planes, we observe propagation in the second band. For an intense probe beam, the propagation entails a focussing non-linearity which can overcome diffraction and we observe the formation of continuous as well as discrete solitons. A wide input beam, on the other hand gets destabilized by modulational instability. Finally, in disordered landscapes, we study the Anderson Localization of light waves in 2D. The disorder-induced localization is strongly affected by the correlation properties of the disorder, as well as the spectral content of the probe beam.

Julien Armijo
Departamento de Fisica, Center for Optics and Photonics,
Facultad de Ciencias, Universidad de Chile, Santiago, Chile

Date submitted: 20 Feb 2013 Electronic form version 1.4