

Fractional quantization in nonlinear optical Thouless pumps

Marius Juergensen, Sebabrata Mukherjee,
Mikael C. Rechtsman

*Penn State University, University Park, PA, USA
16802*

mcrworld@psu.edu

I will present my group's recent experimental work on the fractional pumping of solitons in nonlinear photonic Thouless pumps, using waveguide arrays. Specifically, I will show that the displacement (in unit cells) of solitons in Thouless pumps is strictly quantized to the Chern number of the band from which the soliton bifurcates in the low power regime; whereas in the intermediate power regime, nonlinear bifurcations lead to fractional quantization of soliton motion. This fractional quantization can be predicted from multi-band Wannier functions associated with the states of the pump.