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Simulating bosons in magnetic field with photonics MOHAMMAD HAFEZI[1], Joint Quantum Institute, MIKHAIL LUKIN, EUGENE DEMLER, Harvard University, EDO WAKS[2], JACOB TAYLOR[3], Joint Quantum Institute — We propose a 2D photonic system where the dynamics of photons are analogous to charged bosons in a magnetic field. We show that a magnetic field can be 'simulated' for photons without using a magnetic field or any time-reversal symmetry breaking mechanism. We apply a technique to probe transport properties of such systems. In particular, the underlying energy spectrum is manifested in the transmission and reflection coefficients in form of a Hofstadter butterfly. We also discuss the effect of loss in such systems and investigate the system's robustness to impurities.

[1]University of Maryland
[2]University of Maryland/NIST
[3]University of Maryland/ NIST

Mohammad Hafezi
Joint Quantum Institute

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