Magnetism on the Lieb Lattice\textsuperscript{1} FRÉDÉRIC HÉBERT, Institut Non-Linear de Nice, University of Nice, France, VLADIMIR IGLOVIKOV, RICHARD SCALETTAR, Physics Department, University of California, Davis, GEORGE BATROUNI, Institut Non-Linear de Nice, University of Nice, France — The fermionic Hubbard model on a square lattice is known to exhibit antiferromagnetism at half-filling for arbitrarily weak interactions, due to the nesting of its Fermi surface and the divergence of the density of states. This talk presents a determinant Quantum Monte Carlo study of the magnetic properties of the Hubbard model on the “Lieb lattice,” which is obtained from the square lattice by removing 1/4 of the sites in a regular pattern. This model exhibits a flat band at half-filling, surrounded by two dispersive bands. The non interacting states at half-filling are localized, which allows us to study the magnetic properties of a system that does not have a Fermi surface, although there is an infinite density of states at half-filling. Other magnetic phases may also appear away from half-filling.

\textsuperscript{1}Research supported by the CNRS-UC Davis EPOCAL LIA joint research grant; by NSF-PIF-1005503 and DOE SSAAP DE-NA0001842.