## Abstract Submitted for the MAR06 Meeting of The American Physical Society

Electric field effects in the Hall conductivity<sup>1</sup> ALEJAN-DRO KUNOLD, Departamento de Ciencias Básicas, Universidad Autónoma Metropolitana-Azcapotzalco, Av. San Pablo 180, México D. F. 02200, México, MANUEL TORRES, Instituto de Física, Universidad Nacional Autónoma de México, Apartado Postal 20-364, México Distrito Federal 01000, México — We study the Hall conductivity as a topological invariant under the influence of an intense electric field. We consider a model of a 2DEG in a two-dimensional lattice in the presence of an applied in-plain electric field and perpendicular magnetic field. The Hall conductivity is determined from quasiclassical calculations. In the presence of an electric field the longitudinal quasi-momentum is quantized leading to the appearance of a magnetic Stark ladder, in which the bands of the Hofstadter butterfly are replaced by a series of quasi discreet levels. We show that the transverse conductivity of this levels is an integer topological invariant independent of the intensity of the electric field thus leading to an integer Hall conductivity.

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