Zero differential resistance state in 2D dimensional electron system in strong magnetic field.\textsuperscript{1} SERGEY VITKALOV, JING-QIAO ZHANG, The City College of New York, A. A. BYKOV , A. K. KALAGIN, A. K. BAKAROV, Institute of Semiconductor Physics, 630090 Novosibirsk, Russia --- We report the observation of a zero differential resistance state (ZDRS) in response to direct current above a threshold value $I > I_{th}$ applied to a two-dimensional system of electrons at low temperatures in a strong magnetic field. Entry into the ZDRS, which is not observable above several Kelvins, is accompanied by a sharp dip in the differential resistance. Additional analysis reveals instability of the electrons for $I > I_{th}$ and an inhomogeneous, non-stationary pattern of the electric current. We suggest that the dominant mechanism leading to the new electron state is a redistribution of electrons in energy space induced by the direct current.

\textsuperscript{1}supported by NSF: DMR 0349049 and RFBR, project No.04-02-16789 and 06-02-16869