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Electronic Specific Heat and Dissipative Viscosity of Hole-Doped Cuprates PARTHA GOSWAMI, D.B. College, University of Delhi — We investigate a d-density wave (DDW) mean field model Hamiltonian in the momentum space suitable for the hole-doped cuprates, such as YBCO, in the pseudo-gap phase to obtain the Fermi surface(FS)topologies, including the elastic scattering by disorder potential ($|v_0|$). For the chemical potential $\mu = -\ 0.27$ eV (at 10% doping level), and $|v_0| \geq |t|$ (where $|t| = 0.25$ eV is the first neighbor hopping), at zero/non-zero magnetic field (B) the FS on the first Brillouin zone is found to correspond to electron pockets around anti-nodal regions and barely visible patches around nodal regions. We next relate our findings regarding FS to the entropy per particle(S), the electronic specific heat C_{el} and the dissipative viscosity (η). The magneto-quantum oscillations in C_{el} are shown to take place in the moderate disorder regime ($|v_0|$ $\sim$0.2 eV) only for B $\sim$ 40 T. For the density of viscosity $\eta(\mathbf{k})$ on the first Brillouin zone, we find that whereas the negative contribution arises from the electron pockets in the anti-nodal region, the positive contributions are from the hole-pockets in the nodal region. The KSS bound ($\eta/S \geq h/4\pi k_B$)is easily satisfied for the moderately strong disorder potential. The viscosity is found to be proportional to the magnetic field up to B $\sim$ 50 T.

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