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Thermoelectric studies of charge density wave dynamics. ROSS MCDONALD, NHMFL-Los Alamos, NEIL HARRISON, JOHN SINGLETON, NHMFL-LANL, TEAM CDW COLLABORATION — The conventional pyroelectric effect is intimately connected to the symmetry, or rather lack of center of symmetry, of the material. Although the experiments we discuss involve studies of low symmetry materials, the pyroelectric currents observed are of an entirely new origin. Systems with broken-translational-symmetry phases that incorporate orbital quantization can exhibit significant departures from thermodynamic equilibrium due to a change in magnetic induction. For charge density wave systems, this metastable state consists of a balance between the density-wave pinning force and the Lorentz force on the extended currents due to the drift of cyclotron orbits. In this way the density wave pinning potential plays a similar role to the edge potential in a two-dimensional electron gas, leading to a large Hall angle and quantization of the Hall resistance. A thermal perturbation that reduces the pinning potential returns the system towards thermal equilibrium, via a phason avalanche orthogonal to the sample surface. The observation of this new form of pyroelectric effect in the high magnetic field phase (B $>$ 30 T) of the organic charge transfer salt α-(BEDT-TTF)$_2$KHg(SCN)$_4$, thus provides a measure of the phason thermopower.

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