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Spontaneous currents and charge redistribution in Mott insulators DANIEL KHOMSKII, Universitaet zu Koeln, LEV BULAEVSKII, CHRISTIAN BATISTA, Los Alamos National Laboratory, MAXIM MOSTOVOY, Groningen University — The standard view is that at low energies Mott insulators exhibit only magnetic properties while charge degrees of freedom are frozen out as the electrons become localized by a strong Coulomb repulsion. We demonstrate that this is in general not true: for certain spin textures *spontaneous circular electric currents* or *nonuniform charge distribution* exist in the ground state of Mott insulators. The latter can give a purely electronic mechanism of *multiferroic behaviour*. In addition, low-energy “magnetic” states contribute comparably to the dielectric and magnetic functions, leading to interesting phenomena such as the electric field-induced “ESR” transitions, rotation the electric field polarization and resonances which may be common for both functions producing a negative refraction index in a window of frequencies.

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