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Density wave patterns for fermionic dipolar molecules on a square optical lattice: mean field theory analysis KARLIS MIKELSONS, JIM FREDERICKS, Georgetown University — We model a system of ultra cold fermionic dipolar molecules on a two dimensional square lattice. Assuming that the molecules are in their nondegenerate hyperfine ground state, and that the dipole moment is polarized perpendicular to the planes, we approximate these molecules as spinless fermions with long range repulsive dipolar interactions. We use mean field theory to obtain the phase diagram as a function of the filling, the strength of interaction and the temperature. We find a number of ordered density wave phases in the system, as well as phase separation between these phases.

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