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Noncollinear textures in moiré magnets

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Two-dimensional magnetism and moiré physics are two very rapidly growing fields due to recent experimental advances. In this work, we demonstrate how noncollinear magnetic textures may arise in a bilayer of two-dimensional ferromagnets when the interlayer Heisenberg coupling is stacking-dependent. In particular, we focus on the chromium halides (CrX_3) and study theoretically how the magnetic textures can be controlled through a twist, strain, or an external magnetic field. We find that ferromagnetic and antiferromagnetic regions can coexist by forming noncollinear textures in two dimensions. These can be controlled and forced to undergo spin-flip or spin-flop transitions through external parameters.