

Abstract Submitted
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Squaring the Triangle: Insulating Ground State of $Na_{0.5}CoO_2$ ¹
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of Illinois — We demonstrate that at a filling of $n = 1.5$, an hexatic insulating
state obtains in the extended Hubbard model on a triangular lattice. Composed
of two tetragonal sublattices with fillings of $n = 1$ and $n = 2$, the insulating state
is charge ordered and possesses an antiferromagnetic superlattice with dimension
 $a \times \sqrt{3}$. Two distinct energy scales arise in our model, a charge gap for the insulator
and the effective exchange interaction in the antiferromagnet. Our model is capable
of explaining the sign change of the Hall-coefficient as a function of temperature as
well as the persistence of antiferromagnetism above the insulating state.

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