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Quantum phase with no translational symmetry and its potentiality for quantum communication

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By the method of terahertz photo-voltaic spectroscopy we have found a quantum phase that possesses neither continuous nor discrete translational symmetry. The phase is originated from quantum Hall state under nonzero toroidal moment. In the phase, we have observed the effect of a distant response to a local laser excitation. We provide strong evidence that the effect is the implementation of a purely quantum communication, which is unrelated to quantum entanglement and based solely on instantaneous collapse of electron wavefunction under interaction.

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