

Abstract Submitted
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Flip Chip: Keep pristine materials clean ARJAN BEUKMAN, FAN-MING QU, LEO KOUWENHOVEN, Delft Univ of Tech — We introduce the Flip Chip setup, a new platform which allows nanoscale electrical gating of a material without exposing it to invasive nanoprocessing. The conventional fabrication of metallic gate structures on pristine materials degrades their interesting properties, e.g., ultra-high mobility in GaAs heterostructures. This research takes a new approach to keep the material unaffected. The gate structure is fabricated on a separate chip which is flipped and brought close (<100 nm) to the sample under research. A vacuum gap between the gates and material, acting as an insulating layer, solves the problem of leakage and trapped charges in traditional gate-dielectrics. In addition, this approach allows more freedom in fabrication methods, as the ‘dirty’ processing is done on a separate chip. With the Flip Chip setup we intend to study the $5/2$ FQH state in GaAs heterostructures which is expected to have non-Abelian statistics. I will present measurement results for an interferometer at integer quantum Hall states using the Flip Chip technique.

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