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Graphene ribbon electronics ZHIHONG CHEN, PHAEDON AVOURIS, IBM T.J. Watson Research Center, IBM T.J. WATSON RESEARCH CENTER TEAM — Graphene consists of a single layer of carbon atoms that are arranged in a hexagonal structure. This ideal two-dimensional system represents a gapless semiconductor with six intersecting points per Brillouin zone between the valence and conduction band. In principle, a semiconducting gap can be introduced when the width of the graphene sheet is made small enough and the carbon hexagons are orientated in certain directions. In this study, we have combined e-beam lithography and etching techniques to form graphene ribbons of different widths. Electrical properties of these ribbons were studied through gate dependent transport measurements at various temperatures.

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