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Transport in chemically gated graphene p-n junctions CHRISTOPH TEGENKAMP, JENS BARINGHAUS, Leibniz University Hannover, Institut für Festkörperphysik, ALEXANDER STÖHR, ULRICH STARKE, Max Planck Institut für Festkörperforschung, Stuttgart, Germany — The chirality of charge carriers in graphene allows them to get through potential barriers without any reflection (known as Klein tunneling). To study this effect the fabrication of well-defined p-n junctions is necessary. We use the intercalation of Ge to convert the buffer layer on the SiC(0001) surface into graphene with local p-type or ntype doping depending on the local Ge coverage. The buffer layer is initially patterned using optical lithography, to fabricate isolated n-p, npn and pnp-structures. The n- and p-type doping (340 meV, -290 meV) is confirmed by STS which also reveals very narrow p-n junctions with a length below 5 nm. The corresponding electric fields are as high as $10^6 V/cm$ and therefore significantly higher than those induced by field effects, providing a perfect environment to study Klein tunneling. Transport experiments are carried out by means of a 4-tip STM system,on n-p-n as well as p-n-p structures. Their resistance was found to be strongly dependent on temperature and the inner barrier length. While short barriers ($<$ 200 nm) appear almost transparent, the resistance increases rapidly for barrier widths exceeding the coherence length ($>$ 600 nm).

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