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Graphene Nanoribbons with Crystallographically-Orientated Edges[1] JAVIER SANCHEZ-YAMAGISHI, KEN VAN TILBURG, VITOR MANFRINATO, MIT, LEONARDO CAMPOS, UFMG, KARL BERGERREN, PABLO JARILLO-HERRERO, MIT — When graphene is confined to a nanoribbon a transport gap is opened which allows for field effect transistor operation. Such graphene nanoribbon FETs have been demonstrated, but are thought to be dominated by edge disorder and hence operate far from the the intrinsic regime. We present graphene devices with nanoribbons defined by crystallographically-orientated edges. The devices are formed by Ni nanoparticles which cut graphene along crystallographic directions, unlike the randomly orientated edges produced by standard plasma etching processes. We present TEM and AFM characterizations of the cutting process, as well as electronic measurements of the produced nanostructures.

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