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Abstract:We discuss here the use of a graphene monolayer to realize the concept of "cloaking by a surface", proposing the thinnest possible mantle cloak with operation in the far-infrared and terahertz (THz) regime. We show that an atomically thin graphene monolayer may drastically suppress the scattering of planar and cylindrical objects and, at the same time, preserve moderately broad bandwidth of operation. In addition, we exploit the large tunability of the graphene conductivity to provide active, dynamically tunable invisibility cloaks and versatile THz switching devices. © 2011 American Chemical Society.