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"Intrinsic" terahertz plasmons and magnetoplasmons in single layer graphene on SiC IRIS CRASSEE, DPMC, Université de Genève, Suisse, MILAN ORLITA, LNCMI, CNRS-UJF-UPS-INSA, Grenoble, France. Charles University, Praha, Czech Republic, MAREK POTEMSKI, LNCMI, CNRS-UJF-UPS-INSA, Grenoble, France, DIRK VAN DER MAREL, DPMC, Université de Genève, Suisse, MARKUS OSTLER, THOMAS SEYLLER, University of Erlangen-Nurnberg, Erlangen, Germany, ALEXEY KUZMENKO, DPMC, Université de Genève, Suisse — Plasmons in graphene have lately attracted much attention, to great extent, due to promises for novel technologies. Recently, plasmon absorption in graphene was attained in deliberately patterned structures [1]. We measured the magneto-optical absorption and Faraday rotation response of highly doped single layer graphene, epitaxially grown on Si-terminated SiC substrate. The zero-field spectra show a clear plasmon peak at about 2 THz. In magnetic fields, the plasmon peak splits into two branches, thus showing a characteristic magneto-plasmon behavior which was previously observed in periodic dot structures in GaAs two dimensional electron gases [2]. Hence, in large-scale epitaxial graphene on SiC, light can couple to plasmons in the absence of the intentional patterning of graphene. We suggest that optically-active plasmon absorption in this kind of two-dimensional system arises from laterally confined plasmon modes due to "intrinsic" imperfections of graphene on Si-face of SiC, such as, grain boundaries which we clearly identify with AFM methods.

[1] L. Ju *et al.* , Nature Nanotechnology **6**, 630 (2011).
[2] A. J. Allen *et al.* , Phys Rev B **28**, 4875 (1983).

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