Abstract Submitted
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**Exciton band structure in two-dimensional materials** PIER LUIGI CUDAZZO, LSI Ecole Polytechnique France, LORENZO SPONZA, Kings College London UK, CHRISTINE GIORGETTI, LUCIA REINING, FRANCESCO SOTTILE, MATTEO GATTI, LSI Ecole Polytechnique France — In low-dimensional materials the screening of the Coulomb interaction is strongly reduced[1,2]. As a consequence, the binding energy of both Wannier and Frenkel excitons in the optical spectra is large and comparable in size. Therefore, contrarily to bulk materials, it cannot serve as a criterion to distinguish different kinds of excitons. Here we demonstrate that the exciton band structure, which can be accessed experimentally, instead provides a powerful way to identify the exciton character. By comparing the ab initio solution of the many-body Bethe-Salpeter equation for graphane and single-layer hexagonal BN, we draw a general picture of the exciton dispersion in two-dimensional materials, highlighting the different role played by the exchange electron-hole interaction and by the hopping terms related to the electronic band structure. 1 Pierluigi Cudazzo et. al. Phys. Rev. Letter 104 226804 (2010) 2 Pierluigi Cudazzo et. al. Phys Rev. B 84, 085406 (2011)

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