Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Study of the Temperature-Dependence of Exciton Lifetime in Single-Layer WSe_2 XIAOXIAO ZHANG, YUMENG YOU, FAN ZHANG, JAMES HONE, TONY HEINZ, Columbia University — Two-dimensional layered transition metal dichalcogenides (TMD) have recently received much attention because of their distinctive optical properties, including their strong excitonic interactions and the tightly bound trion states that they support. In this paper, we report the results of time-resolved photoluminescence measurements on exfoliated monolayer samples of WSe_2. The lifetime and quantum efficiencies of different emission features, including those from neutral and charged excitons, were found to display a strong temperature dependence over the range of 10-300K. We discuss the results in terms of the structure of the conduction band near the K-point and of the possible roles of different exciton states.

Xiaoxiao Zhang
Columbia University

Date submitted: 19 Nov 2013 Electronic form version 1.4