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Disorder Induced Melting of Charge Density Wave Order in doped 2H-NbSe2 systems UTPAL CHATTERJEE, STEPHAN ROSENKRANZ, JOHN CASTELLAN, JASPER VAN WEZEL, RAY OSBORN, Argonne National Laboratory, MARIA IVARONE, Temple University, GORAN KARAPETROV, Drexel University — Using a combination of Angle Resolved Photoemission Spectroscopy (ARPES), X-ray diffraction, transport and Scanning Tunneling Microscopy (STM) measurements on pristine as well as disordered 2H-NbSe2 samples, we have found that the onset Temperature Tcdw for Long Ranged Charge Density Wave (CDW) order gets quickly suppressed with concentration of disorder ions (X) and at certain critical concentration (Xc) it undergoes a quantum melting. Our STM measurements provide the evidence for local CDW ordering in doped samples for temperatures way above Tcdw. On the other hand, our ARPES measurements have found evidences for the presence of energy gap for both T>Tcdw & X>Xc. We argue, all these experimental observations from completely different probes hint towards phase fluctuations of the order parameter as the mechanism behind the destruction of CDW order in quasi 2-d systems, such as 2H-NbSe2.

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