

# Investigating Moiré Physics in 2D heterostructures using EMPAD detector:

A study of Charge Density Mapping

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## Abstract

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# 1 Introduction

1. use of tmdc, QComp, optoelec
2. flat bands

## **2 Theory**

### **2.1 TMDC/Crystal structure**

1. crystal lattice
2. diffraction patter / reciprocal space

### **2.2 Moiré**

1. moire pattern
2. mini brillouin zone
3. hybridisation and inter/intra transistions
4. band bending types, umklapp, flat bands

## **3 Methods**

### **3.1 Mechanical transfer**

### **3.2 TEM / EMPAD / EELS?**

1. electron microscope workings
2. empad detector working / uses
3. CoM for electric and magnetic fields
4. charge density mapping
5. Strain mapping

## **4 Results**

## References