

Semiconductors are renowned for their extreme versatility. Their properties can be changed in a wide range, e.g., by doping during the growth or by illumination by light. In recent years it was discovered that some class of materials are also sensitive to the thickness - properties of a bulk crystal are significantly different than properties of a single atomically-thin layer. The project is related to two semiconductors from this class: WSe_2 and MoTe_2 . Both of these systems exhibit excellent optical properties, which makes them interesting for optoelectronic applications.

The experiments proposed in the project will allow us to better understand the nature of the dynamical effects in the studied materials. The thin layered materials studied so far exhibit very short decay time of the optical emission, which is comparable with the time resolution of the fastest cameras. In the course of the project we will determine if the characteristic time of optical emission in MoTe_2 is long enough to overcome this limitation. The positive verification of this hypothesis would allow us to directly observe the profile of the emission and therefore give better insight into the mechanisms governing electron behavior in the whole class of materials.