

# TES spectrometer for Shanghai X-ray Free Electron Laser Facilities

Shuo Zhang; Yanru Song; Xiaosong Liu; Zuqian Weng; Zhi Liu

shuozhang@shanghaitech.edu.cn

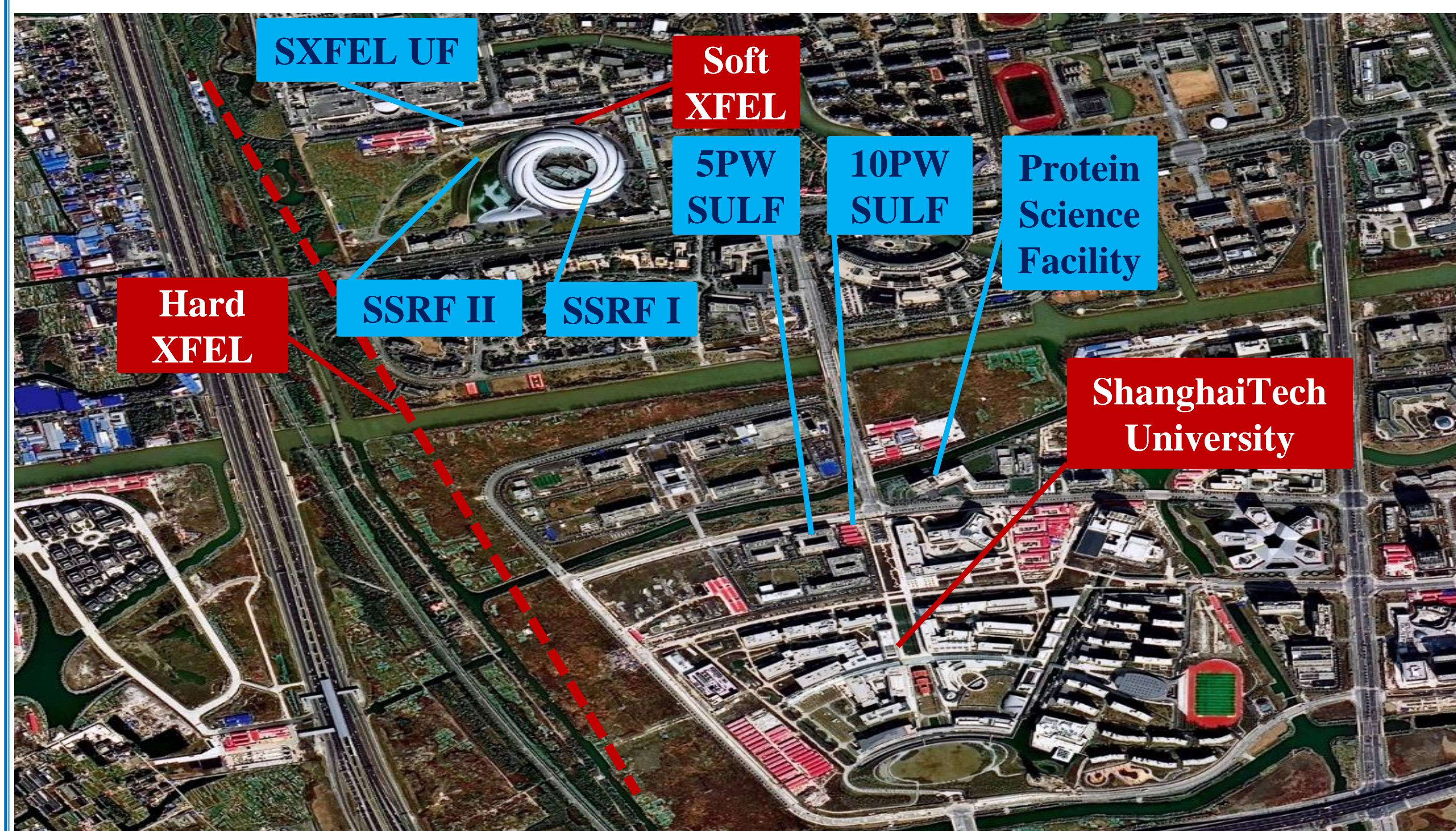


上海科技大学  
ShanghaiTech University

## Abstract

ShanghaiTech University is hosting Shanghai soft X-ray Beamline Project (SBP) and Shanghai High repetition rate XFEL and Extreme light facility (SHINE) project which are aimed for applications in material science, energy, environment, physics, chemistry and bioscience etc. In these projects, Transition Edge Sensor (TES) spectrometers are deployed. Our goal is to develop TES spectrometers for both soft X-ray and hard X-ray wavelengths. Up to now, our TES system is ready for data measurement, the preliminary data shows an energy resolution of 14eV@5.9keV.

## Light Source Facilities around us



## TES X-ray Spectrometer System



Fig1: Photo of the TES X-ray spectrometer, the dilution refrigerator can reach down to 21mK, the SQUID and data acquisition (DAQ) system allow 32 pixels readout simultaneously.

## TES Detectors and Cryogenic System

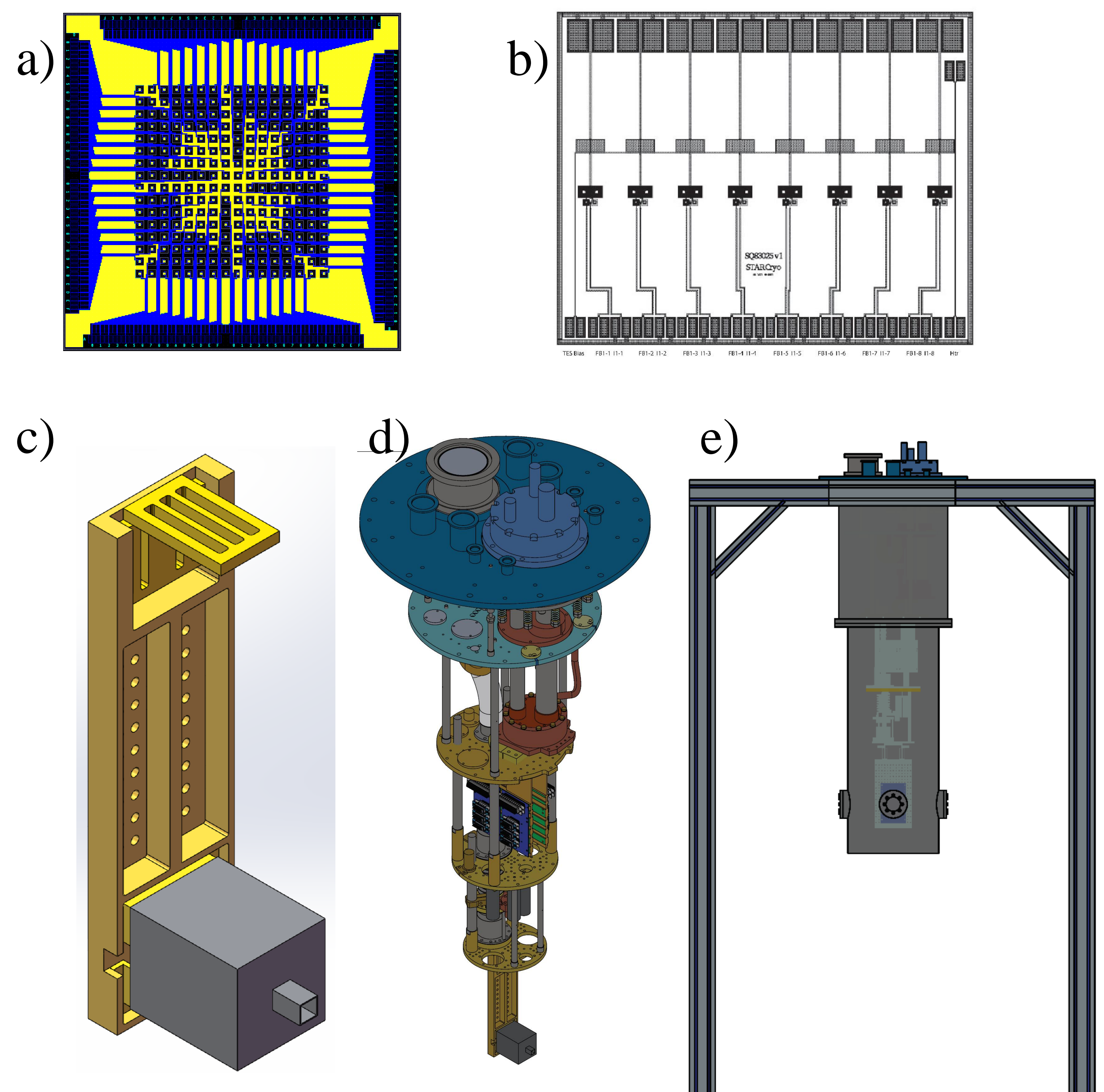


Fig2: The design of a): TES chips(16\*16 pixels), b):SQUID chips, c):Detector assembly setup d): insert of dilution refrigerator and e): dilution refrigerator setup

## First Results

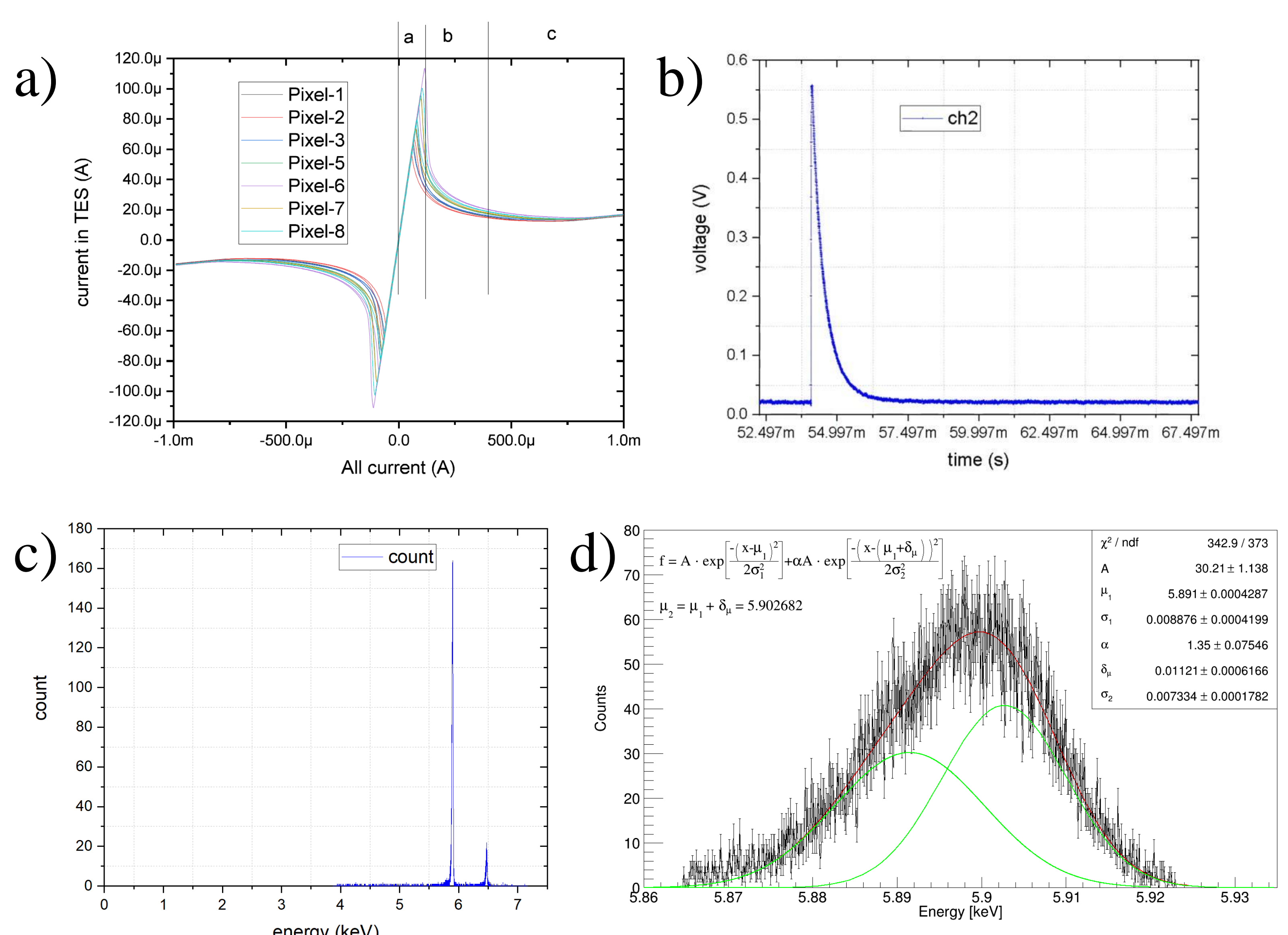


Fig3: a): IV curves under 8 TES channels, b):X-ray pulse on one of the channels, c): TES spectrum around 5.9KeV, d): energy resolution fitting around 5.9KeV

## Acknowledgement

This work is supported by SBP and SHINE.