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# Optimizing the photon energy for strain tensor tomography

Strain tensor tomography constitutes a recently emerging x-ray powder diffraction method that aims at retrieving the six spatially resolved strain tensor components. Tomographic reconstruction is performed by iterative gradient descent, which can suffer from badly conditioned inversion. However, the utilized photon energy impact reconstruction quality in two opposing ways: Lowering photon energy increases the Bragg angles, which stabalizes reconstruction. But at the same time transmission through the sample is decreased, which increases noise. Thus, an optimum must exists and it is the task of the student to find this optimal photon energy with the help of numerical simulations and experimental data analysis performed in python.

### Group

FS-PETRA

## **Project Category**

A4. Development of experimental techniques

## **Special Qualifications**

Python

## **DESY Site**

Hamburg

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