Compton Spectrometer

The aim of the Compton spectrometer is to reconstruct the ELI-NP γ energy spectrum with a non-destructive method. The basic idea is to measure the energy and the scattering angle of electrons recoiling at small angles from Compton interactions of the beam on a micrometric target (1-100 μm). The scattered gamma is also acquired for trigger purpose.

### Expected Performances

<table>
<thead>
<tr>
<th>Beam energy distribution</th>
<th>Reconstructed beam energy</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Beam energy distribution" /></td>
<td><img src="image2.jpg" alt="Reconstructed beam energy" /></td>
</tr>
</tbody>
</table>

### Compton Spectrometer

- **Beam peak energy uncertainties**
  - $E_{\gamma} - E_{\gamma_{\text{peak}}}$
  - $E_{\gamma_{\text{stat}}}$

- **Beam bandwidth uncertainties**
  - $\sigma_{\text{BW}}$
  - $\Delta E_{\gamma}$
  - $\Delta E_{\gamma_{\text{stat}}}$

### Gamma Detector

- **Energy resolution at 1332 keV**
  - $R_g = 0.759\pm0.045$ keV

### Si-strip preliminary tests:

- **Cluster identification**
- **Signal shape identification**

### References


---

### Compton Spectrometer

- **Compton Spectrometer**
  - High precision measurement and monitor of the photon energy spectrum by providing the peak energy and the energy bandwith.
- **Nuclear Resonant Scattering System**
  - Detects the resonant gamma decays of selected nuclear levels in order to provide an absolute energy calibration and allow the inter-calibration of detectors.
- **Beam Profile Imager**
  - Check beam alignment and spatial distribution.
- **Gamma Calorimeter**
  - Provide the beam average energy and intensity.

### Gamma Beam Characterization System

- **Signal shape identification**
- **Cluster identification**

### References