**MOTIVATION**

To measure Photo Luminescence intensity at small area

- AL-BSF
- LOCAL-BSF

Figure 1. Microscope photograph of Cross-section

- PERC structure with passivated rear side
- To inhibit rear surface recombination velocity
- Micro scale electrode structure

**APPRAOCH**

Microscopic Photo-Luminescence Analysis

- Excitation Source
  - Laser Diode
  - 850 nm
  - 15W Output power
- Camera
  - Cooled CCD
  - 1024x1024 pixels
  - >960 nm
- Microscope
  - IR objective lens
  - x5, x10, x20

Figure 2. Microscopic PL system

**METHODS and RESULTS**

- Sample preparation
  - Diffusion in front side
  - SiNx on front side
  - AlOx and SiNx on rear side
  - Laser contact opening
  - Thermal annealing
  - Fire through

Figure 3. PERC sample

- PL measurement result
  - Two levels of PL intensity at local BSFs

Figure 4. Microscopic PL image (upper photo)

- PL line profile after baseline correction (lower)

Figure 5. X-ray photograph

- X-ray transmission result
  - Light gray lines mean higher X-ray transmittance
  - Little dark gray line (#1) means lower X-ray transmittance
  - The X-ray result is not equal to the PL result

Table 1. Results of local BSF Analysis

<table>
<thead>
<tr>
<th>local BSF number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>thickness of local BSF (μm)</td>
<td>4</td>
<td>0.2</td>
<td>2</td>
<td>0.2</td>
<td>2.5</td>
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<tr>
<td>PL Intensity (a.u.)</td>
<td>2.9</td>
<td>1.9</td>
<td>2.8</td>
<td>1.9</td>
<td>2.9</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>X-ray check</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>

Figure 6. Cross section SEM photograph