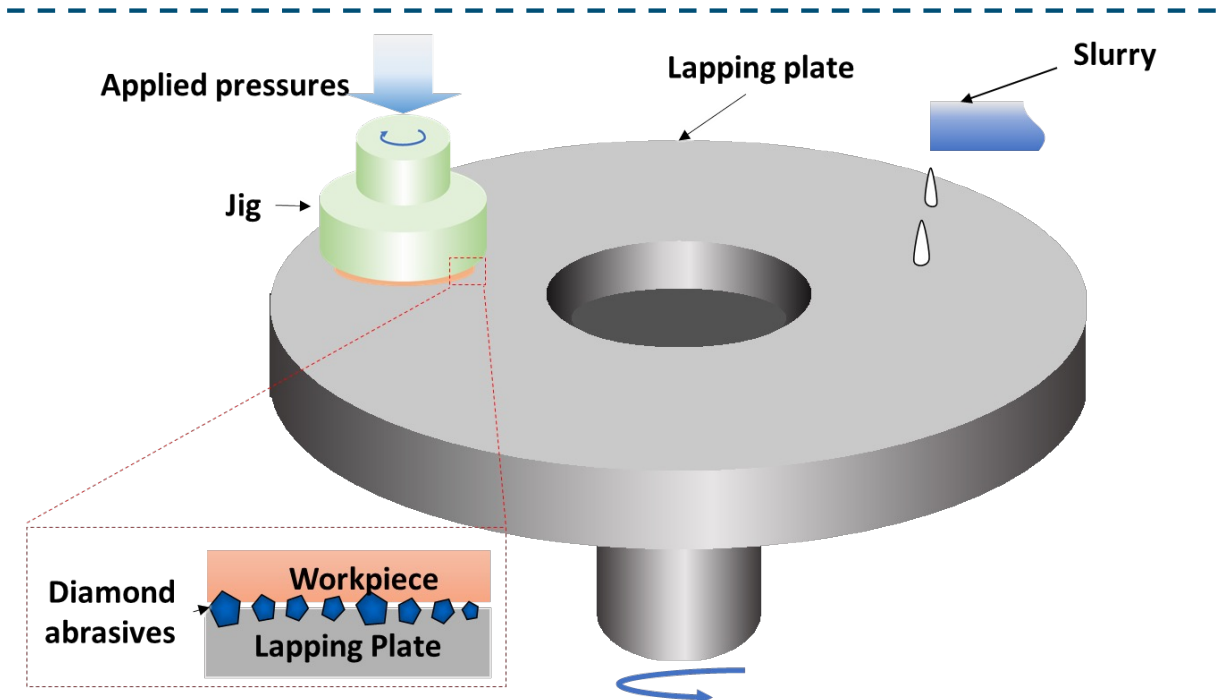
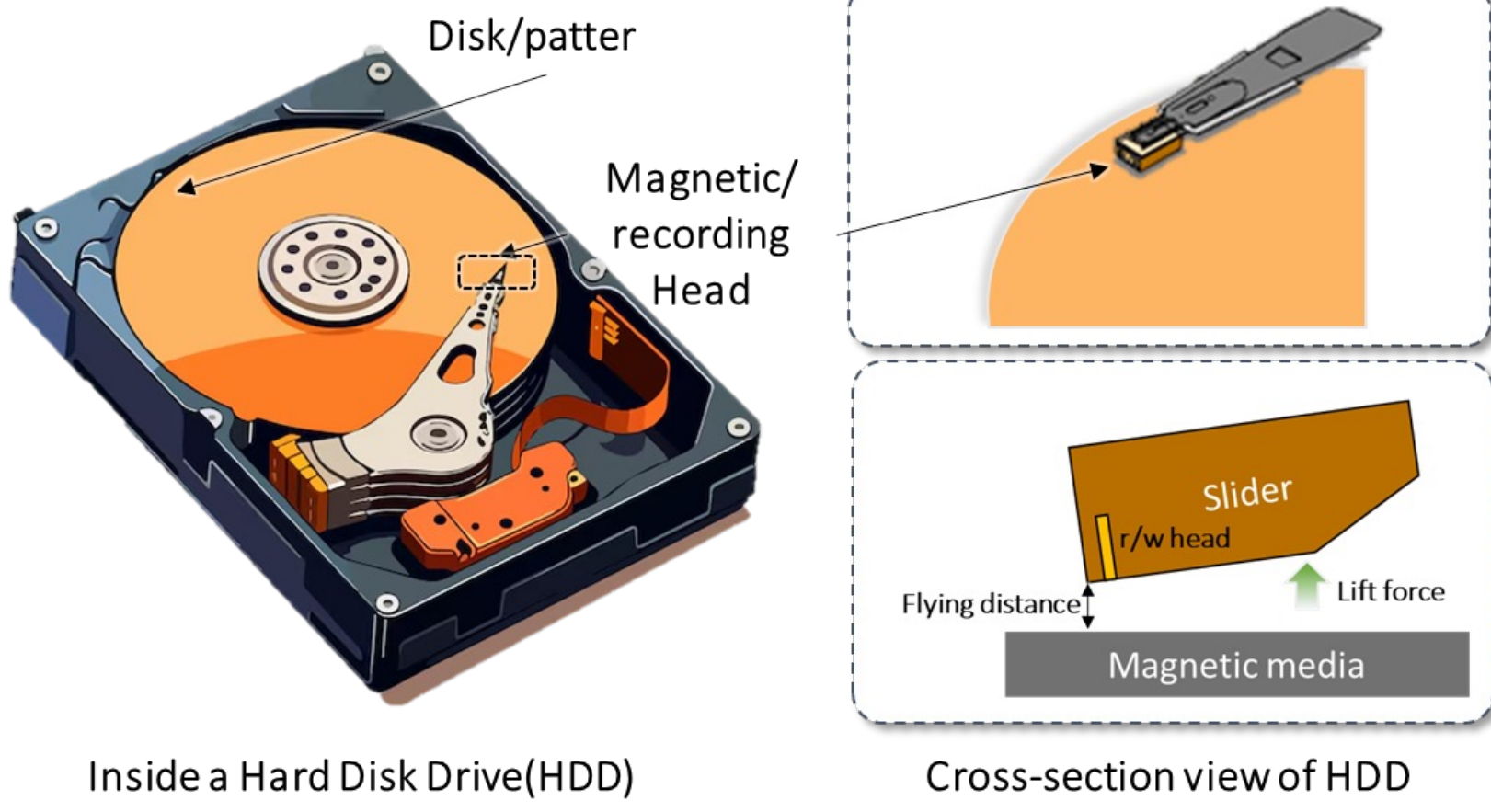


研究背景と目的

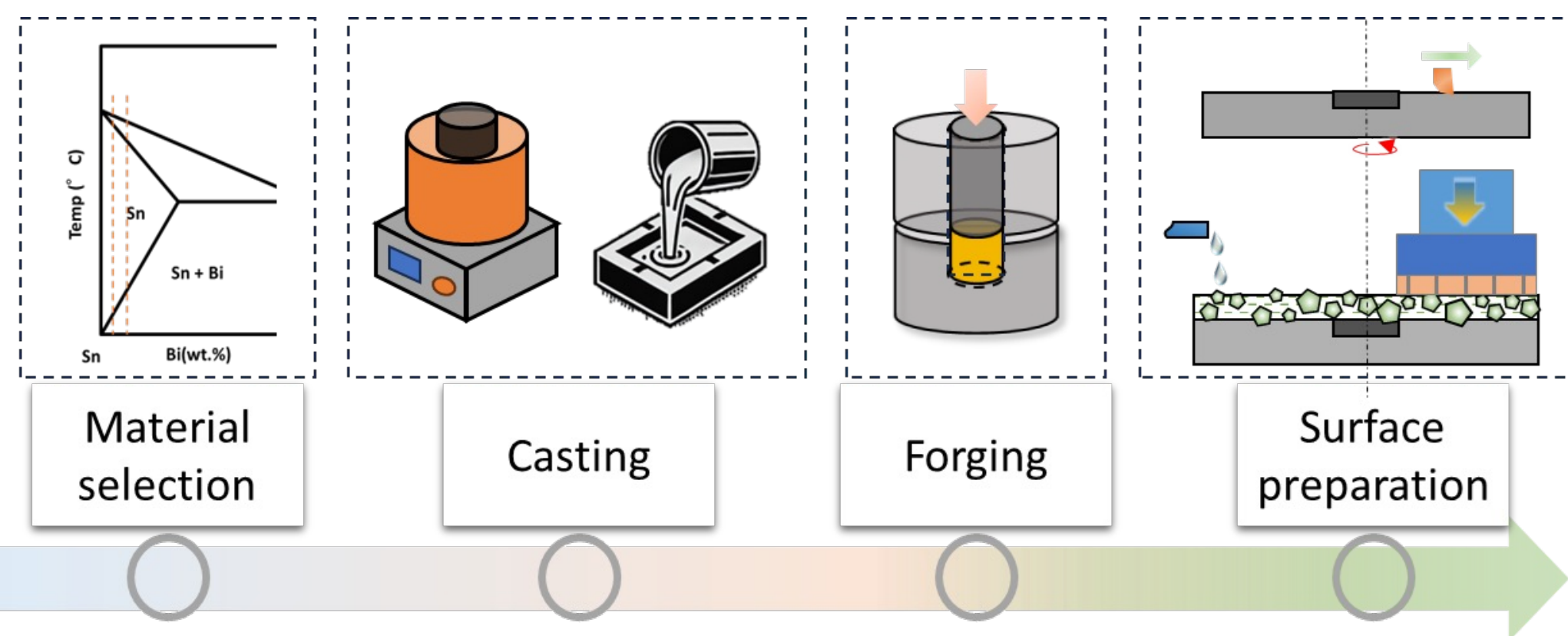
Fix abrasive lapping → widely used in industries, including metal, electrical components manufacture.



Sn alloys with minor additions (1wt.% of Bi or Sb) → lapping plate material in the HDD production.

Fabrication of Sn alloy lapping plate

- ① Material selection;
- ② Bulk alloy fabrication;
- ③ Surface preparation



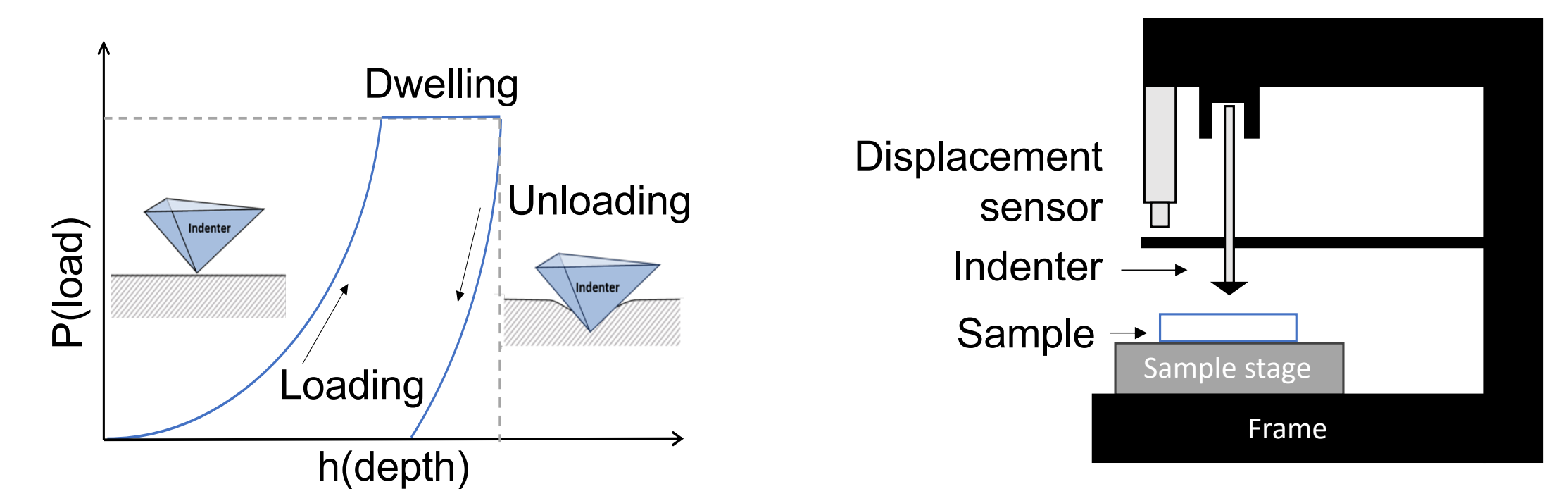
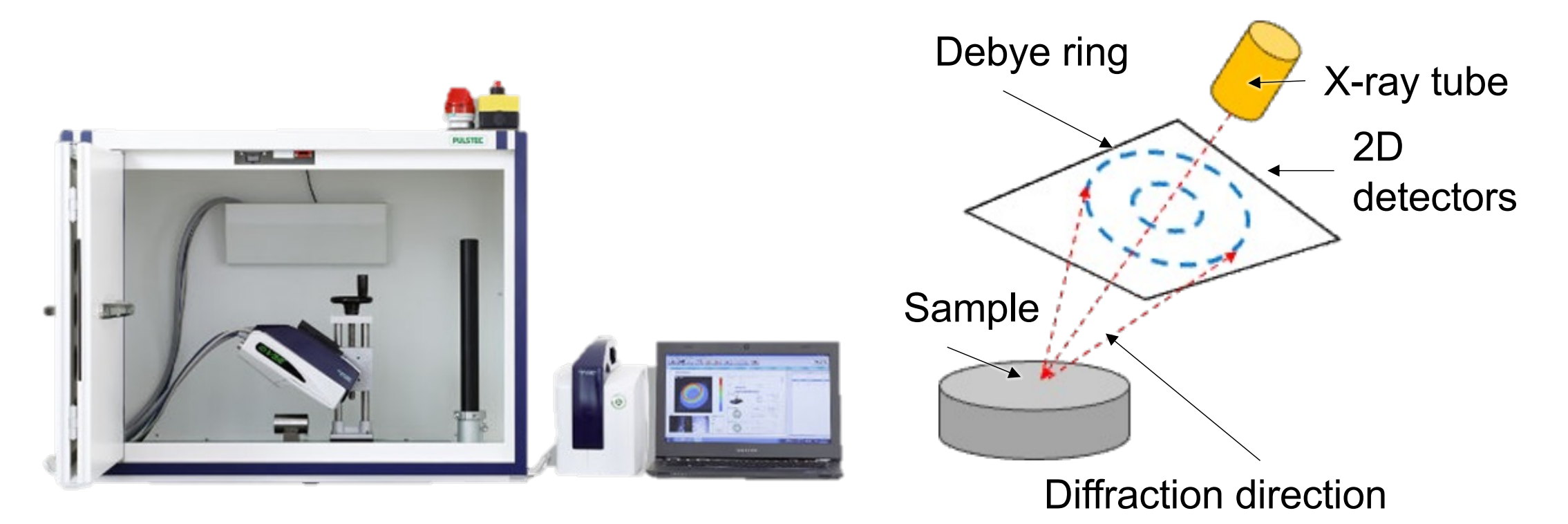
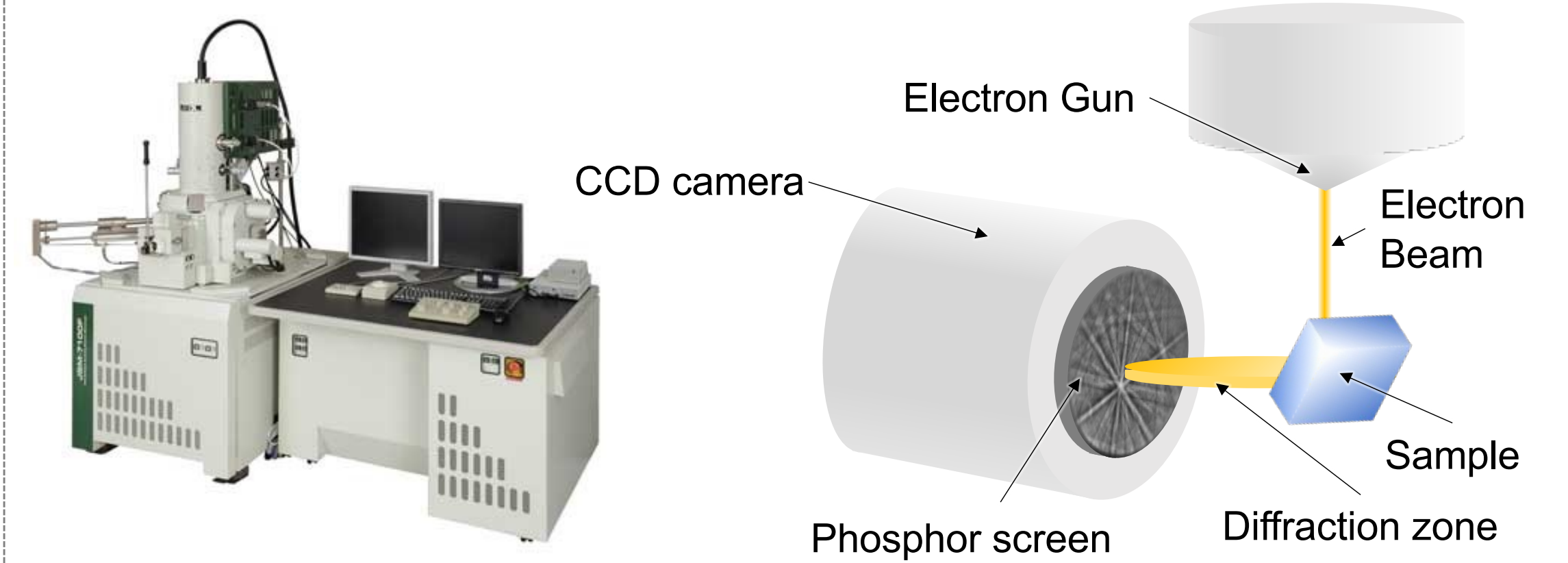
Current issue

Sn alloy plate surface become rougher during exposure time after charging and before lapping the products
 → process instability, poor product lapping quality and lower lapping efficiency
 → negative product qualities and increased costs

Sn properties

→ Sn and many its alloy has relative low melting point
 → $T_{recrystallization}$ of pure Sn near the room temperature

研究方法



成果

Microstructure of SGs

SGs formation: orientation change + GB formation + strain release

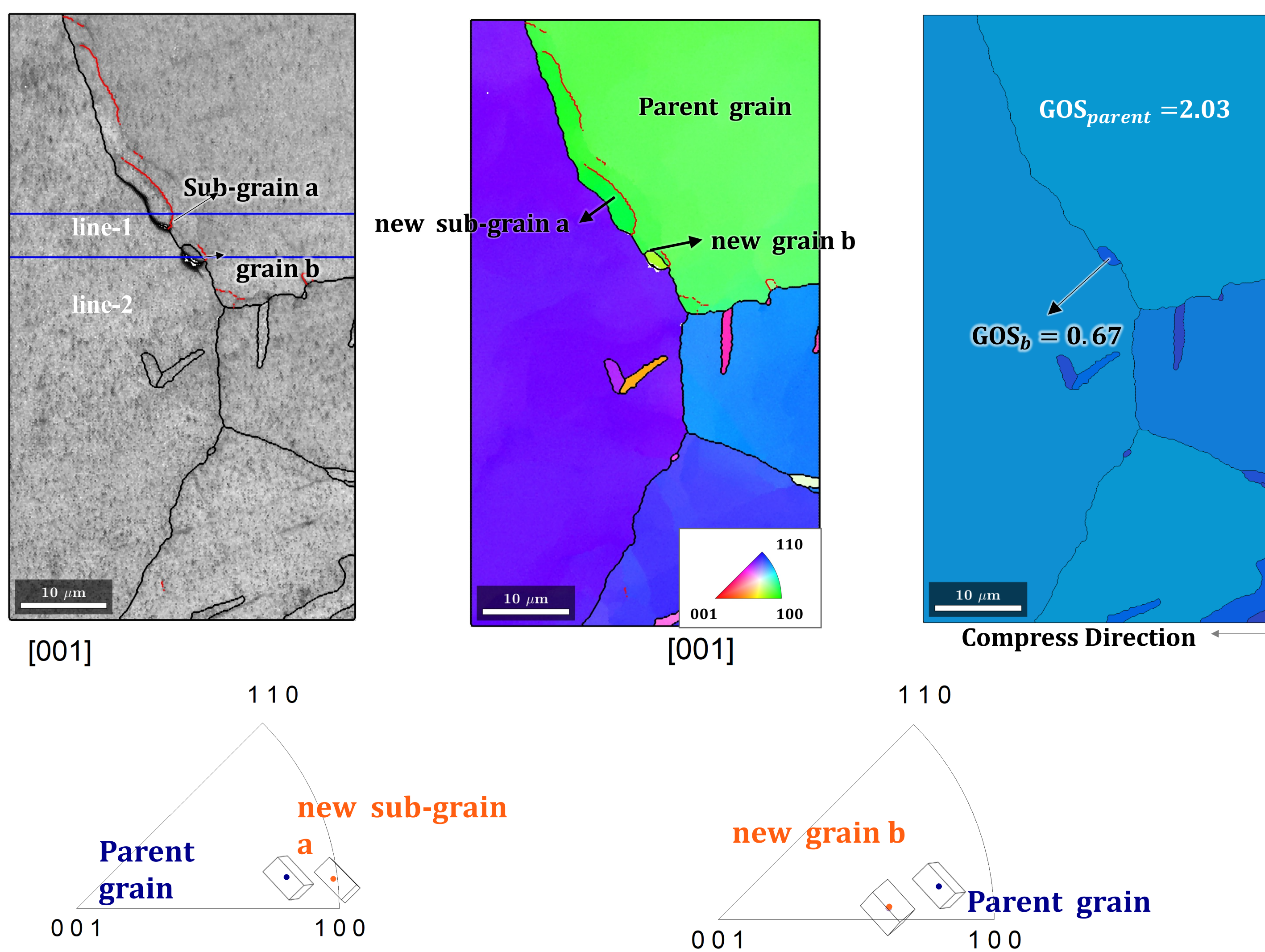


Fig 1. Microstructure for new grain and parent grain

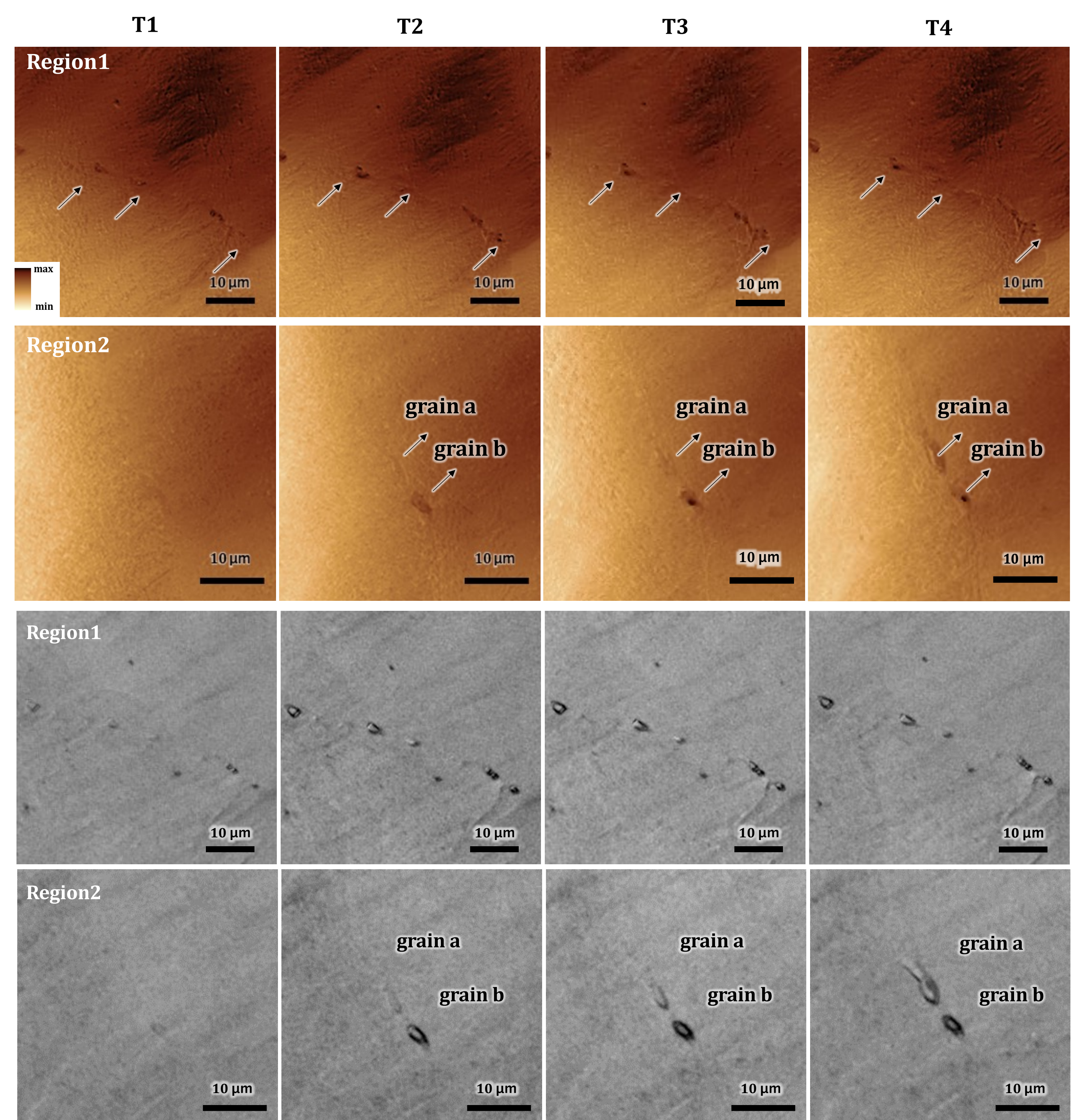


Fig 2. Shallow Grains (SG) on cast Sn alloys

結論

- ❖ **Shallow surface grains** are spontaneously and locally formed **near or along the initial grain boundaries** over exposure time in bulk Sn alloys.
- ❖ Variations in internal stress distribution led to different growth rates of shallow grains, thus affecting the rate of local surface topography changes.