

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Lecture 33 : Quantitative evaluation of Kikuchi Diffraction Pattern – II

Lecture 34 : Quantitative evaluation of Kikuchi Diffraction Pattern – III

Lecture 35 : Analysis using the TSL-OIM software

Lecture 36 : Analysis using the AZtecCrystal software

Lecture 37 : Analysis using the ATEX software

Week 8 Lecture Material

Quiz: Week 8 : Assignment 8

Week 8 Feedback Form

Week 9

Week 10

Week 11

Week 12

Download Videos

Assignment Solution

Live Interactive session

# Week 8 : Assignment 8

The due date for submitting this assignment has passed.

Due on 2021-09-22, 23:59 IST.

As per our records you have not submitted this assignment.

- 1) During EBSD of polycrystalline materials: 1 point
- (a) Blurred or diffused Kikuchi patterns are obtained where there is less or no lattice strain.
  - (b) Sharp Kikuchi patterns are obtained where there is high lattice strain.
  - (c) The sharpness of the Kikuchi pattern has nothing to do with lattice strain in the material.
  - (d) None of the above.

No, the answer is incorrect. Score: 0

Accepted Answers: (d) None of the above.

- 2) Hough transformation 1 point
- (a) represents each Kikuchi bands as a point in Hough space (p,θ).
  - (b) represents each points of Kikuchi pattern image into a sinusoidal curve in Hough space.
  - (c) the sinusoidal curves in Hough space from various points of a Kikuchi band meets at a point in Hough space that corresponds to the same Kikuchi band.
  - (d) None of the above.

No, the answer is incorrect. Score: 0

Accepted Answers: (a) represents each Kikuchi bands as a point in Hough space (p,θ). (b) represents each points of Kikuchi pattern image into a sinusoidal curve in Hough space. (c) the sinusoidal curves in Hough space from various points of a Kikuchi band meets at a point in Hough space that corresponds to the same Kikuchi band.

- 3) Detection of points in Hough space than detecting Kikuchi lines directly in pattern space: 1 point
- (a) Yields more accurate results for poor pattern quality because even the faintest Kikuchi line could be converted into brighter detectable spot in the Hough space.
  - (b) Yields less accurate results due to additional processing of the Kikuchi pattern.
  - (c) The accuracy remains the same.
  - (d) yields more accurate results for poor pattern quality and lowers accuracy for high pattern quality.

No, the answer is incorrect. Score: 0

Accepted Answers: (a) Yields more accurate results for poor pattern quality because even the faintest Kikuchi line could be converted into brighter detectable spot in the Hough space.

- 4) Pattern/image quality maps get affected by 1 point
- (a) local crystalline imperfection,
  - (b) surface contamination
  - (c) the phase and orientation
  - (d) atomic number

No, the answer is incorrect. Score: 0

Accepted Answers: (a) local crystalline imperfection, (b) surface contamination (c) the phase and orientation (d) atomic number

- 5) In EBSD, the width of the Kikuchi bands in terms of  $2\theta_B$  can be determined for every specific: 1 point
- (i) working distance i.e., distance between sample and electron gun.  
 (ii) Specimen tilt angle  
 (iii) Distance between the specimen and the phosphor screen detector.
- a. Only (i)
  - b. Combination of (i) and (ii)
  - c. Combination of (i) and (iii)
  - d. Combination of (i), (ii), and (iii)

No, the answer is incorrect. Score: 0

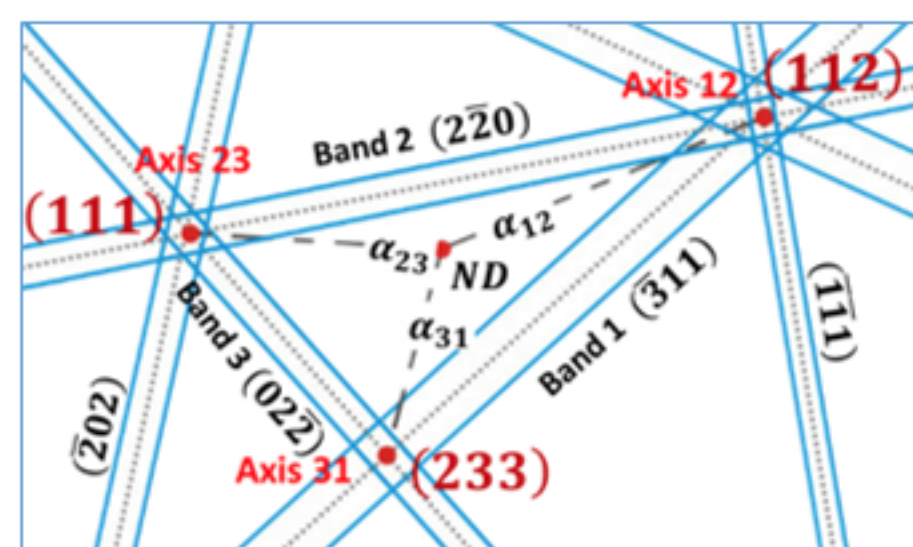
Accepted Answers: d. Combination of (i), (ii), and (iii)

- 6) A colour quantitative microstructural map for one of the sample reference axes with respect to the inverse pole figure colour code and represents the crystallographic orientation of each grains and points of the map is known as as: 1 point
- (a) Unique grain colour map
  - (b) inverse pole figure map.
  - (c) Image quality map
  - (d) Grain boundary map

No, the answer is incorrect. Score: 0

Accepted Answers: (b) inverse pole figure map.

- 7) The ND for the Kikuchi pattern figure shown below with  $\alpha_{12} = 7.2^\circ$ ,  $\alpha_{23} = 8.5^\circ$ , and  $\alpha_{31} = 11.6^\circ$  is: 1 point



- (a) [567]
- (b) [756]
- (c) [658]
- (d) [586]

No, the answer is incorrect. Score: 0

Accepted Answers: (c) [658]

- 8) The data obtained from EBSD can be used to determine: 1 point
- (a) Texture of individual grains
  - (b) Average grain size and grain size distribution
  - (c) Misorientation/Disorientation angle distribution
  - (d) Phase or composition identification

No, the answer is incorrect. Score: 0

Accepted Answers: (a) Texture of individual grains (b) Average grain size and grain size distribution (c) Misorientation/Disorientation angle distribution

- 9) The orientation matrix can be determined from the Kikuchi pattern: 1 point
- (a) If the rotation matrix between the crystal frame of reference and pattern frame of reference is known.
  - (b) If the rotation matrix between the pattern frame of reference and sample frame of reference is known.
  - (c) If the rotation matrix between the crystal and pattern frame of reference and the rotation matrix between the pattern and sample frame of reference are known.
  - (d) None of the above

No, the answer is incorrect. Score: 0

Accepted Answers: (c) If the rotation matrix between the crystal and pattern frame of reference and the rotation matrix between the pattern and sample frame of reference are known.

- 10) Match the following 1 point
- |                                 |                        |                    |
|---------------------------------|------------------------|--------------------|
| A. TSL-OIM                      | Can be used to analyse | 1. *.ctf and *.osc |
| B. AztecCrystal (HKL Channel 5) |                        | 2. *.osc           |
| C. ATEX                         |                        | 3. *.ctf           |
- (a) A-1, B-2, C-3
  - (b) A-2, B-3, C-1
  - (c) A-3, B-1, C-2
  - (d) A-3, B-2, C-1

No, the answer is incorrect. Score: 0

Accepted Answers: (b) A-2, B-3, C-1