

# Half time presentation

Optical properties and growth of 3C-SiC

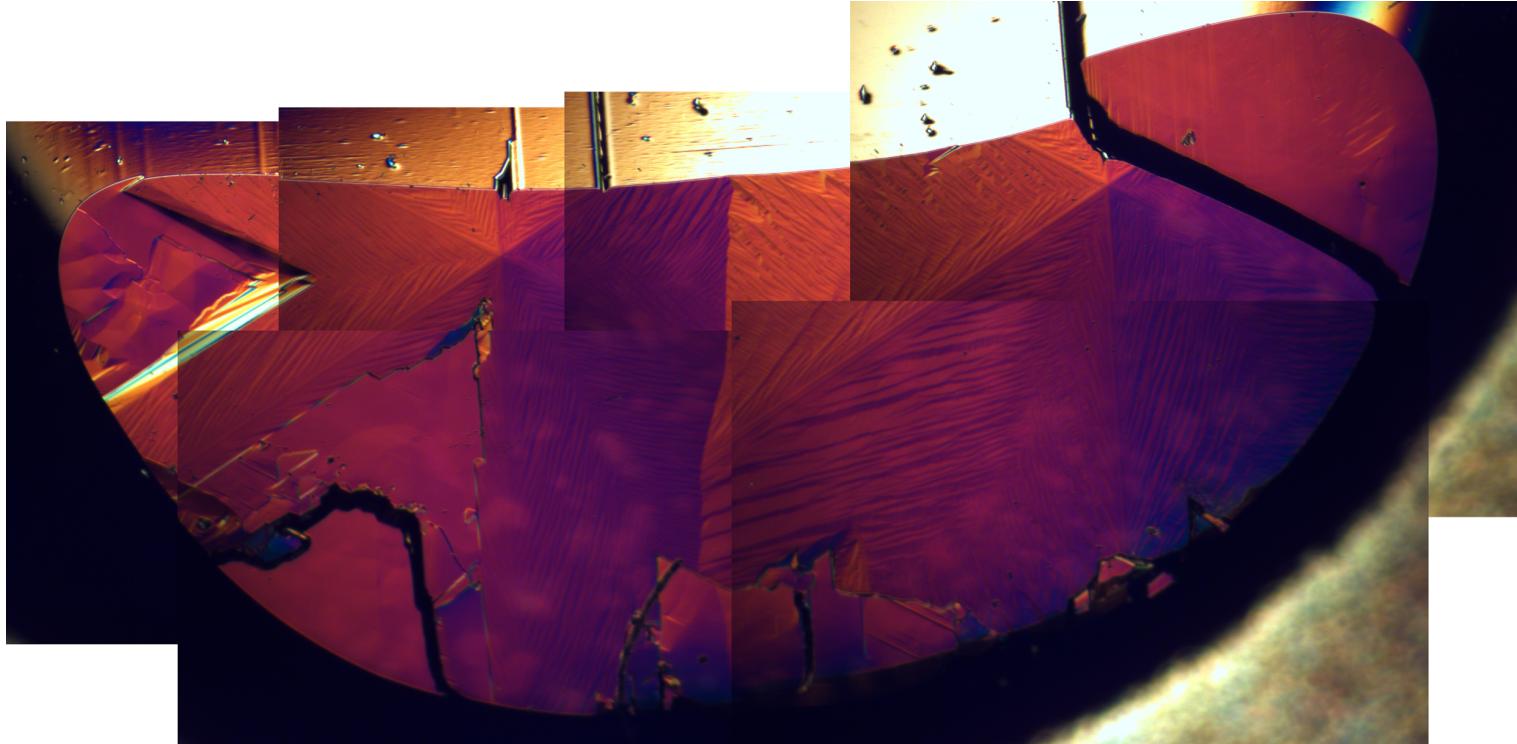
# Overview of activities

- Growth of nominally undoped seeds
  - Si and C face
- Growth of B-doped samples
- LTPL-measurements
- Absorption measurements

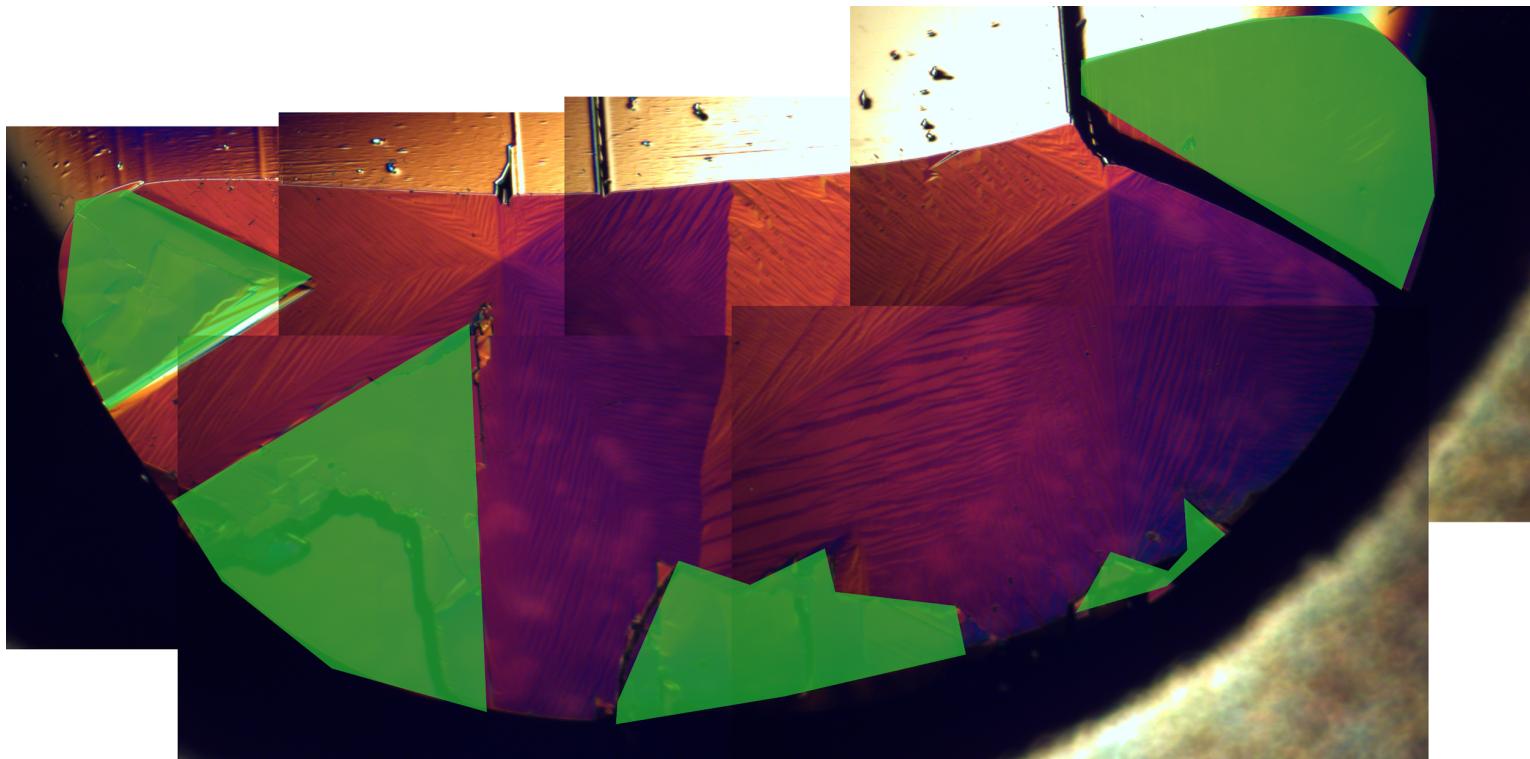
# Seeds on Si and C faces

- All nine Si-face seeds totally cubic
- None of the five C-face seeds
- Temperatures between 1825 and 1925

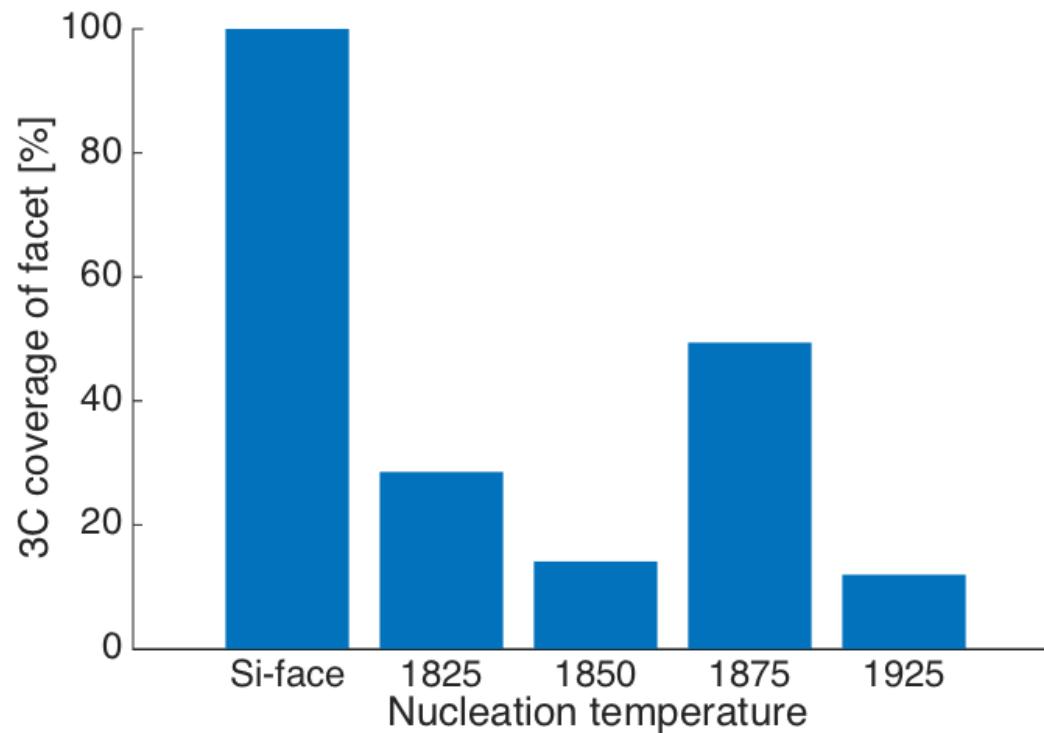
# Seeds on Si and C faces



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# Seeds on Si and C faces



# B-doped samples

- Series 1: E18, E19 and E20
- Series 2: E18 and E20 “background doping”
  - E18 revisited, lower temperature

# Series 1

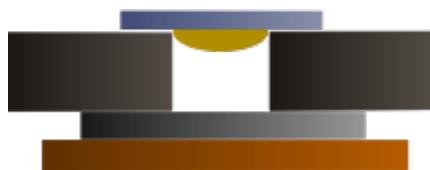
- Poor crystal quality.
- E18 greenish, E19 and E20 black.
- E20 fewest surface defects
  - Carbon face

# Series 2

- Attempted “background” doping

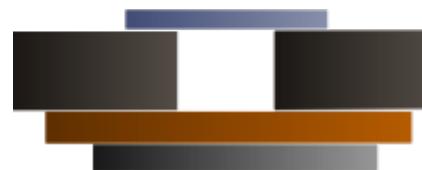
# B-doped samples

Direct doping



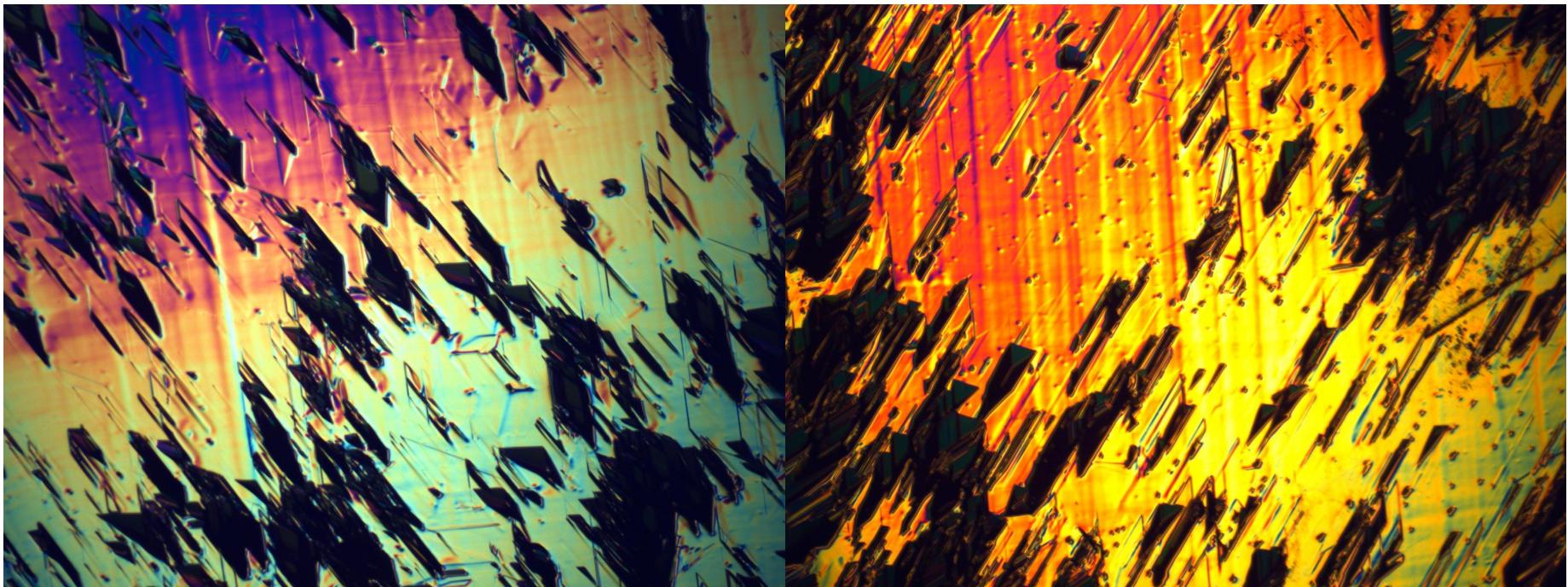
3C seed  
Doped source  
Undoped source

Background doping

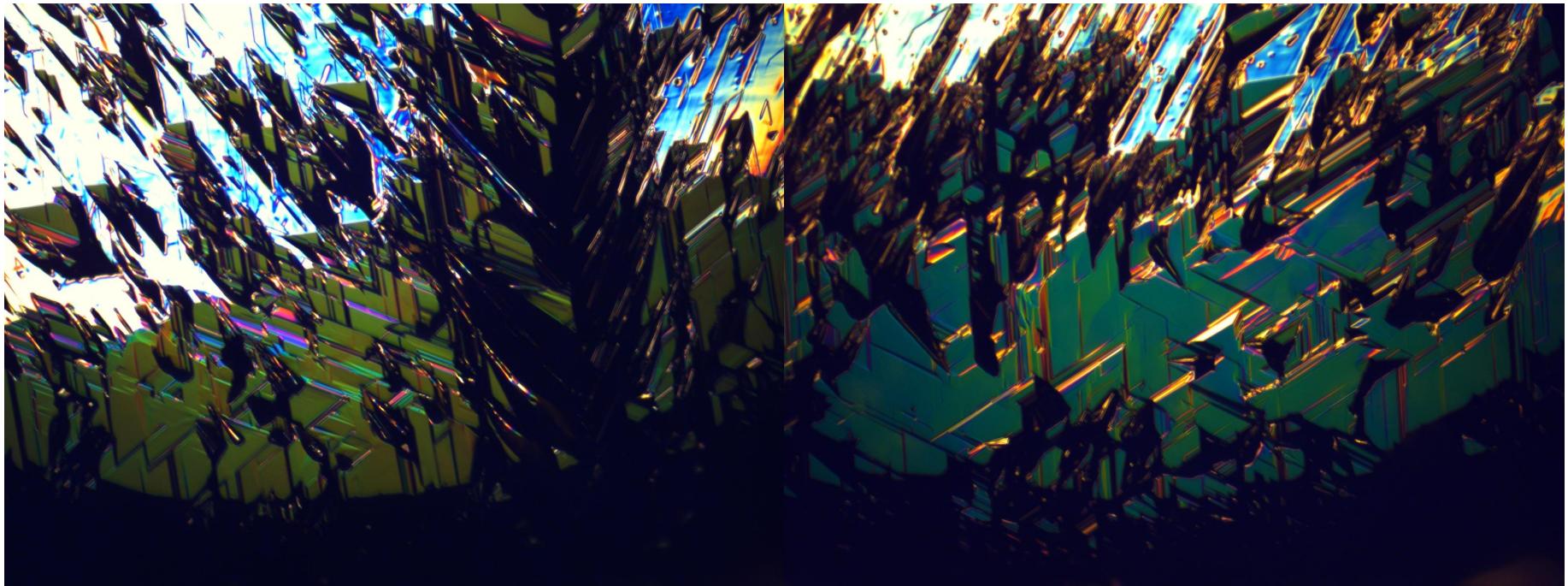


4H substrate  
Undoped source  
Doped source

# Direct vs background (E18)



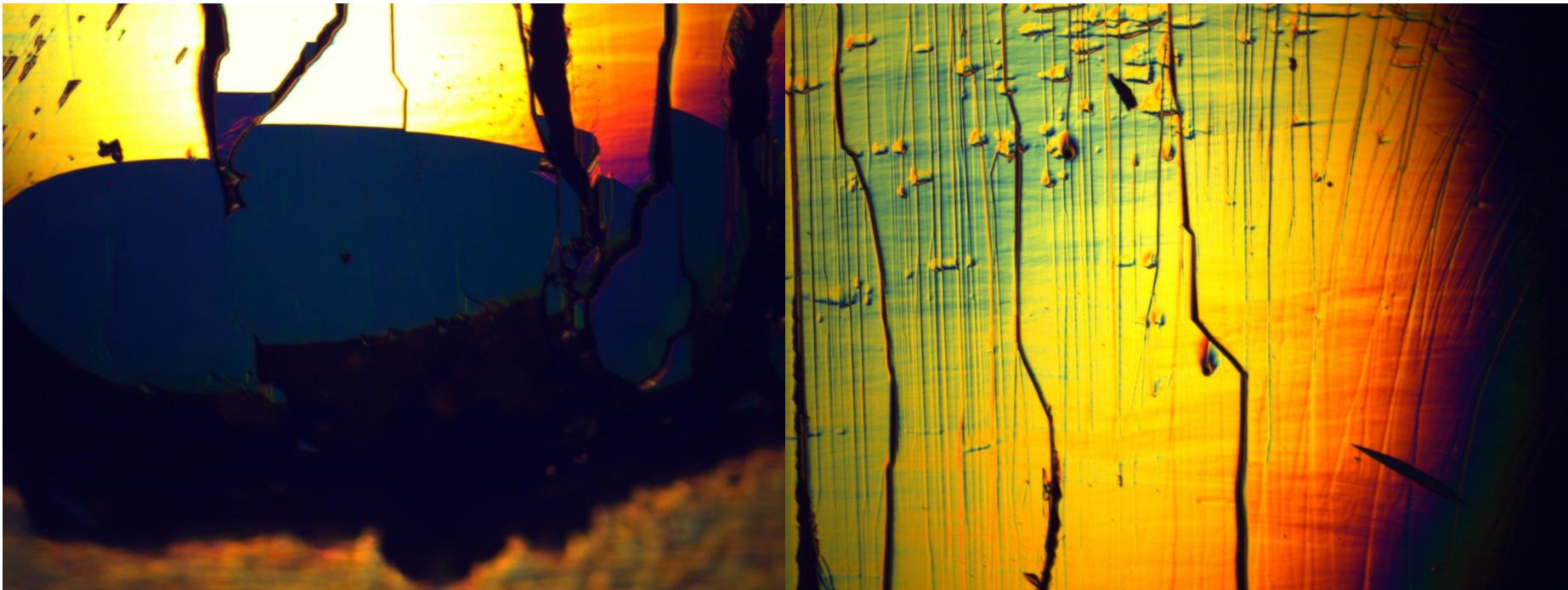
# Direct vs background (E18)



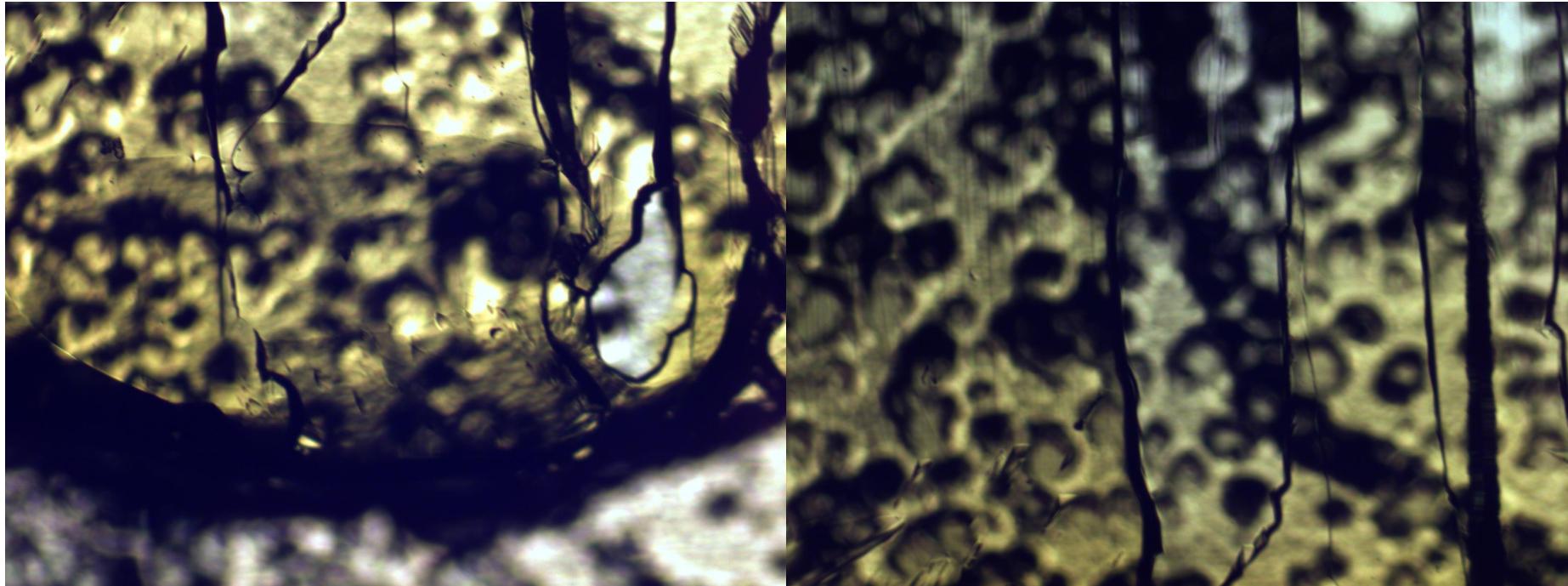
# Direct vs background (E18)

- Direct sample: Greenish
- Background sample: Yellow
  - Possibly not p-type.

# Background E20



# Background E20



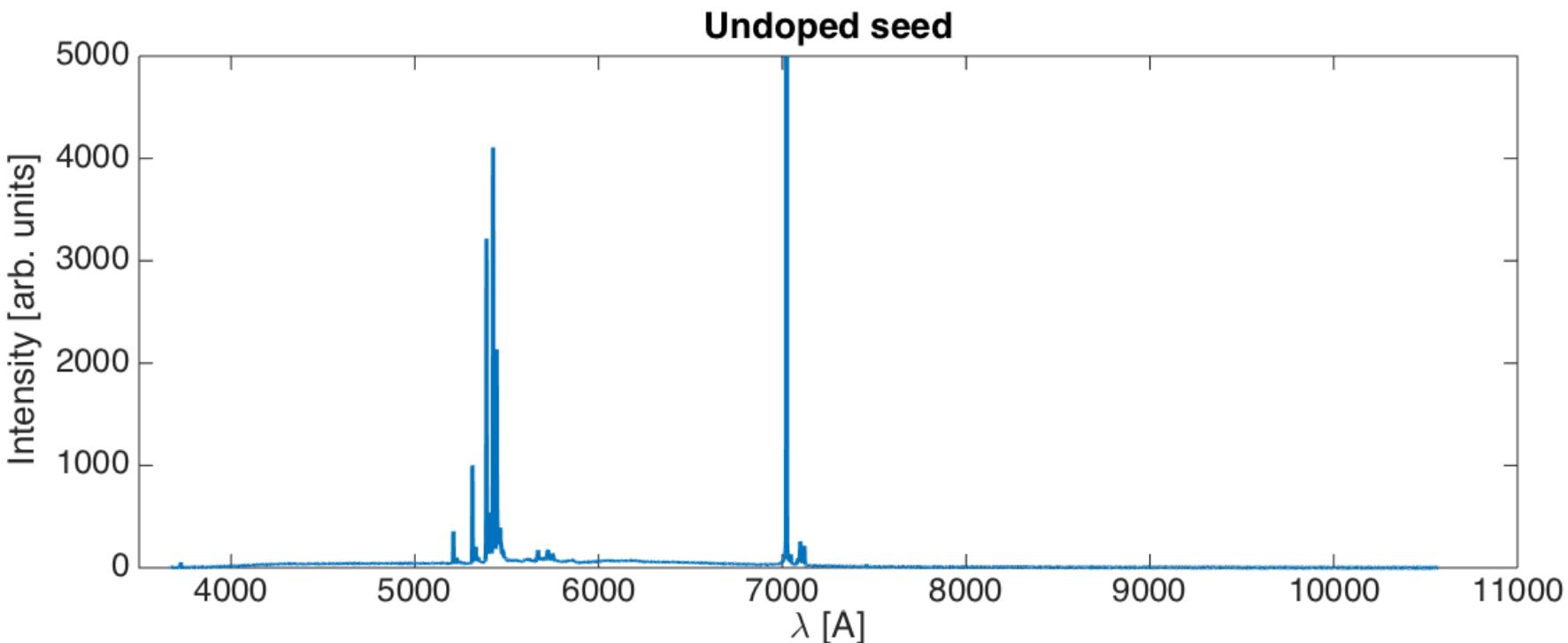
# Background E20

- Best crystal quality
- Not completely cubic
- Yellow color
  - Not p-type?

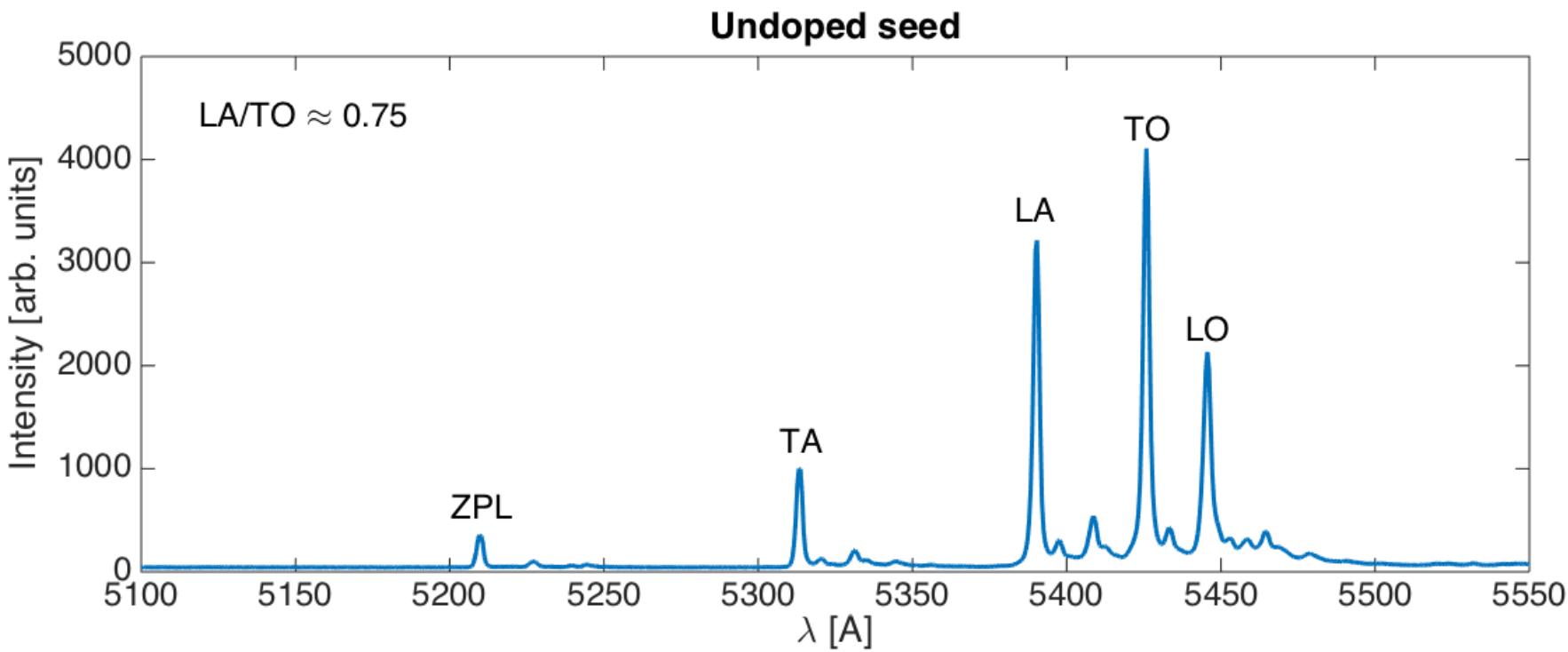
# LTPL - Samples

- B-doped samples
- Nominally undoped seed
- N-doped samples

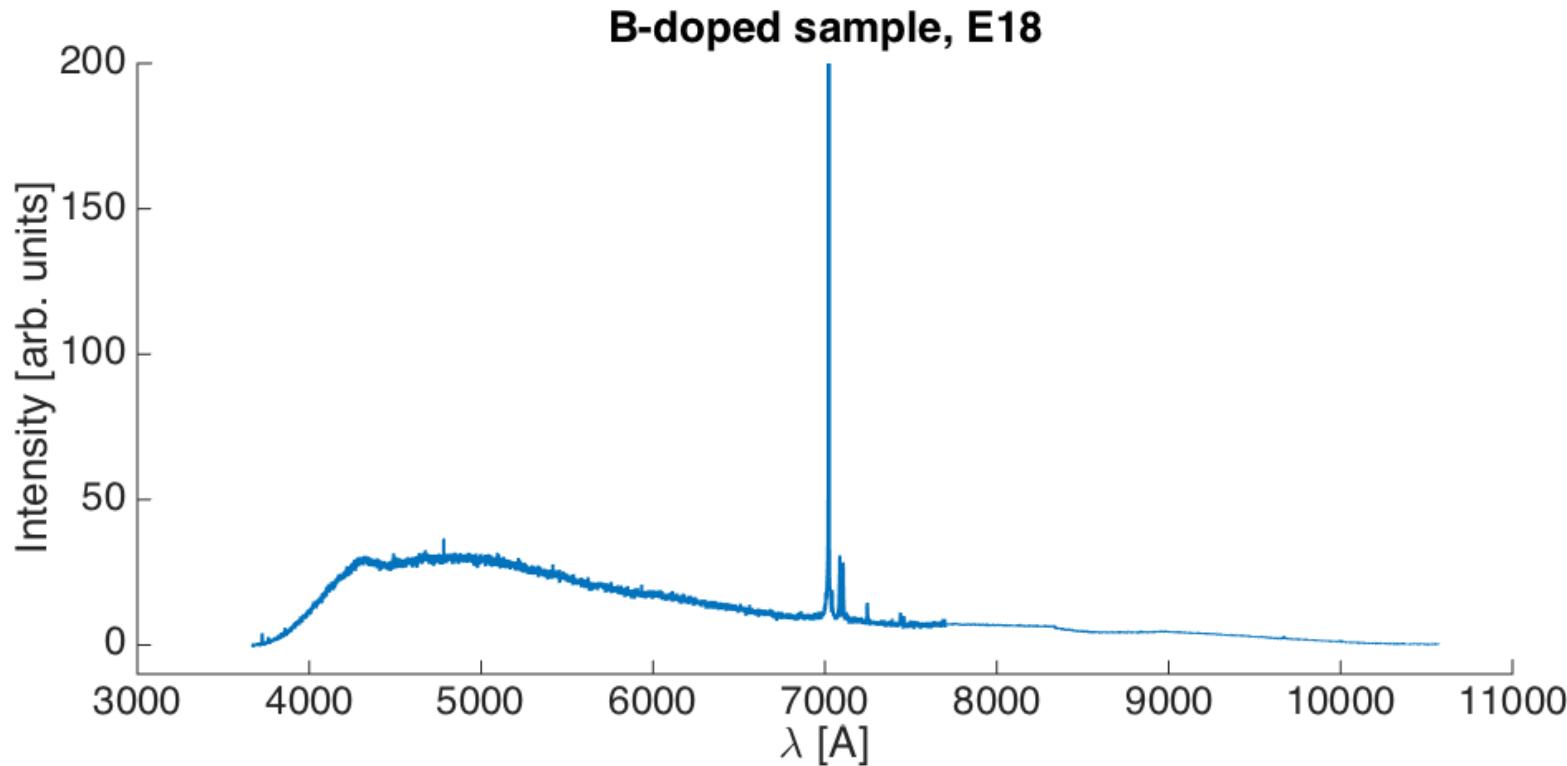
# LTPL - Undoped sample



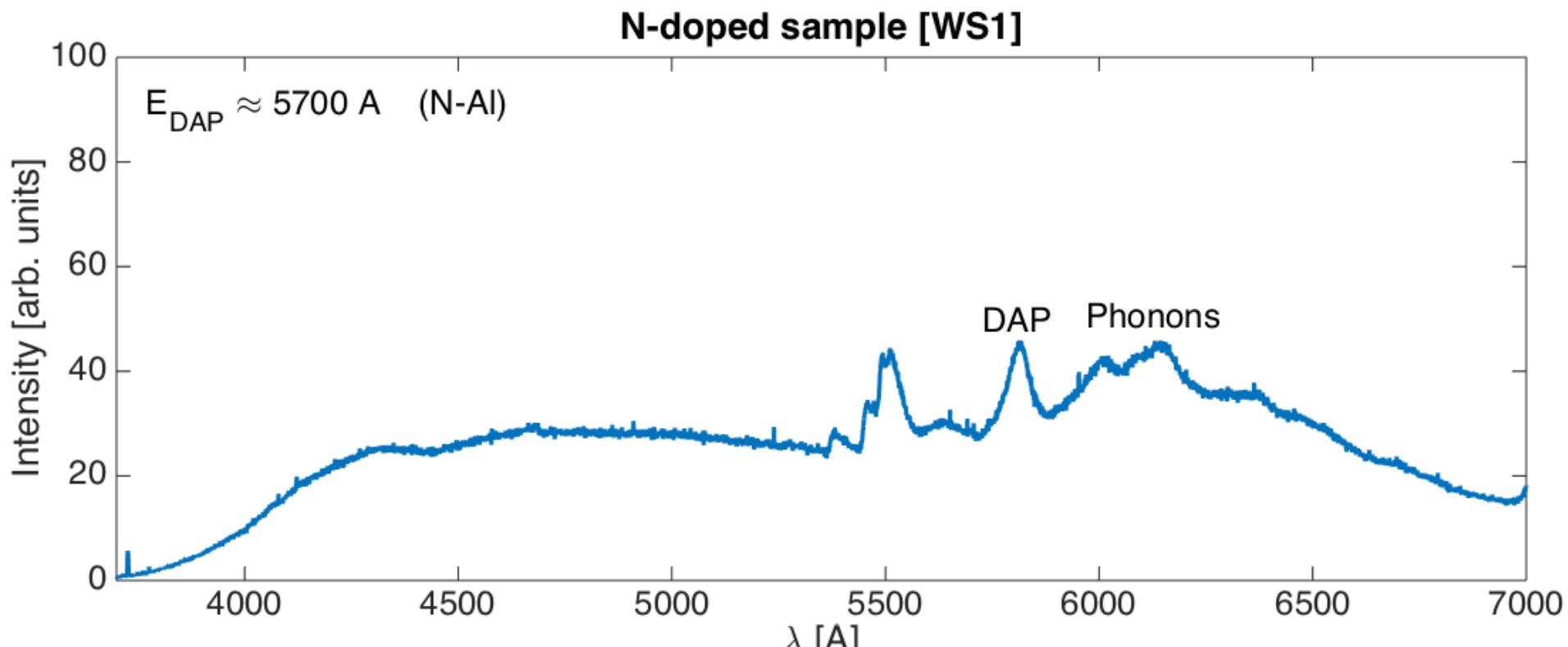
# LTPL - Undoped sample



# LTPL - B-doped samples



# LTPL - N-doped



# Absorption measurements

- No other lines than the DAP.

# Planned activities

- PL-measurements of B-doped series 2
  - New PL setup
  - LTPL?
- Absorption measurements
- Water splitting measurements
  - B-doped series 1
  - Undoped
  - N-doped

# Planned activities

- Contacts for water splitting (n,p,undoped)
  - Metal contact material
  - CV-measurements