EMMI / OBIRCH Batch Acquisitions with the Phemos 1000

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Purpose

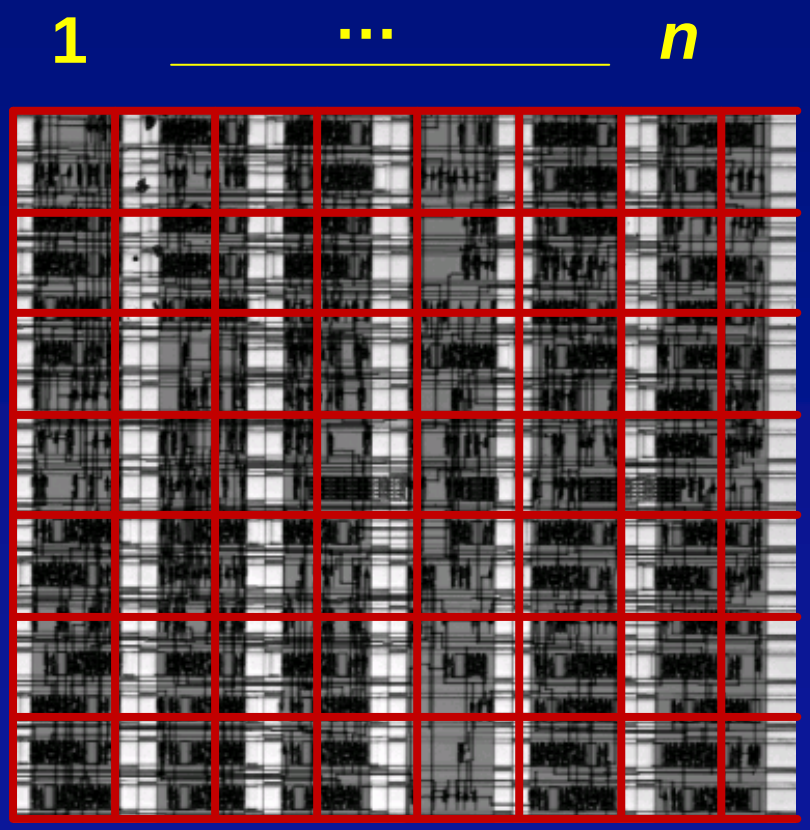
- On large complex ICs, several images are needed to cover the surface.
- Emission microscopy may require 3 minutes or more per image.
- In order to acquire these images (more than 100) over several hours (e.g., 3 hours), automatic batch acquisition allows to create a full poster view of the device.

Outline

- Batch acquisition requirement
- Phemos 1000 limitations
- Implementation: EMMI / OBIRCH
- Results: Solar Cells
- Software interface
  - Poster view
  - Instant zoom on defect

Batch Acquisition Requirement

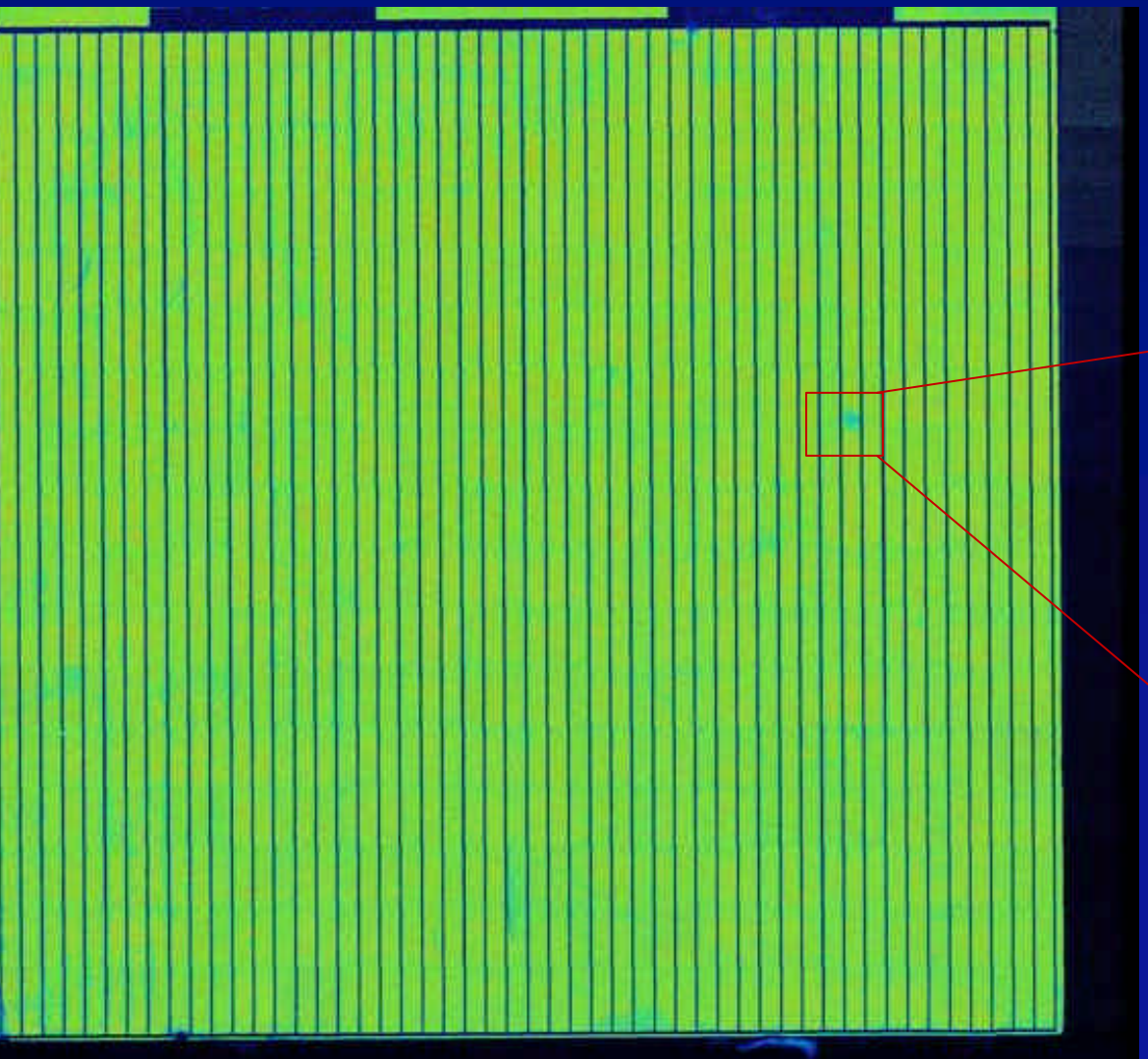
- **Principle: to cover a circuit**
  - 1. Start in top left corner
  - 2. Acquire an image
  - 3. Move left one image
  - 4. Repeat step 2 … until finish
- **Requirements**
  - X,Y,Z Movement
  - Image acquisition CCD/EmMi Laser/Obirch
  - Coordinates for Start/Finish
  - Software interface



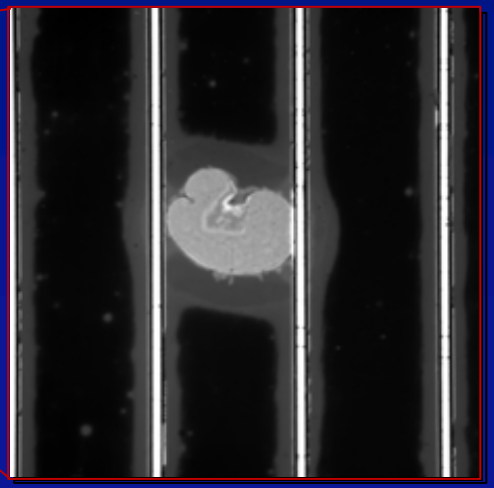
Phemos 1000 Limitations

- **X,Y,Z Movement**
  - ~~From Phemos 1000 Software~~
  - From Ethernet CAD Command ?
  - From SERIAL CAD command → **Serial Card**
- **Image Acquisitions**
  - ~~From Phemos 1000 Software~~ → **Take over existing software**
- **Coordinates of images**
  - ~~From Phemos 1000 Software~~ → **Calibration added**

Results: Solar Cells

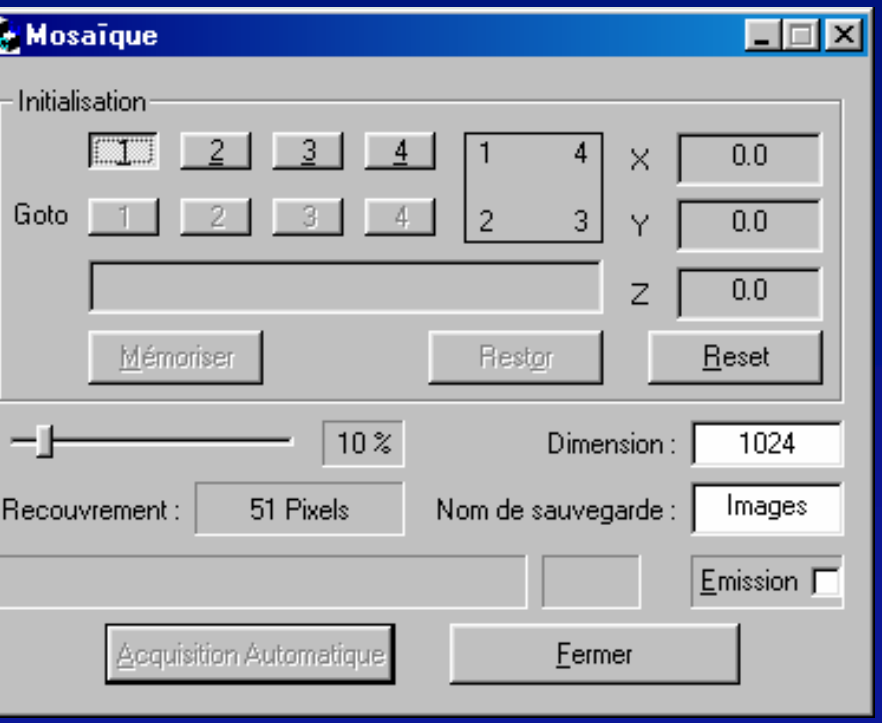


- More than 100 Image 5X to cover 5x5 cm^2

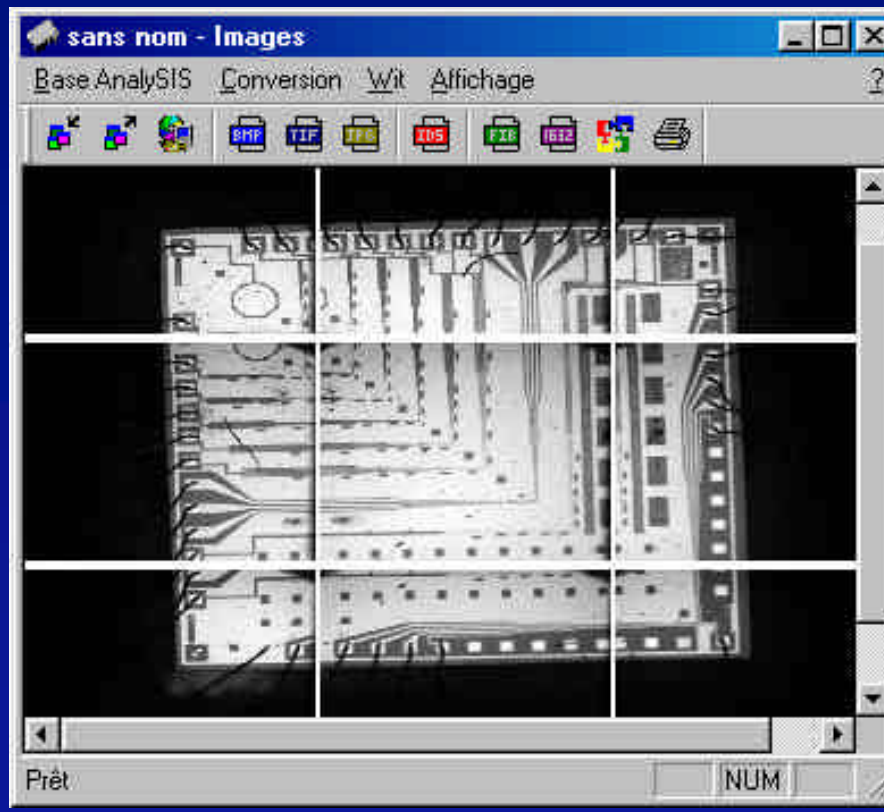


- Defect localization from the poster

Batch Acquisition on the Phemos



- **Acquisition control:**
  4 corners of the circuits



- **Resulting poster**
  before assembly

Conclusion

- **Batch acquisition**
  - Automation to save time
  - 100% coverage without errors on circuit with repetitive cells
- **Phemos 1000 implementation**
  - Done at the CNES: added software
- **Results**
  - Work with Light Emission/CCD and OBIRCH/Laser
  - Click to access to high res. image to locate defect
- **Extensions**
  - Implementation in Hamamatsu DLLs?