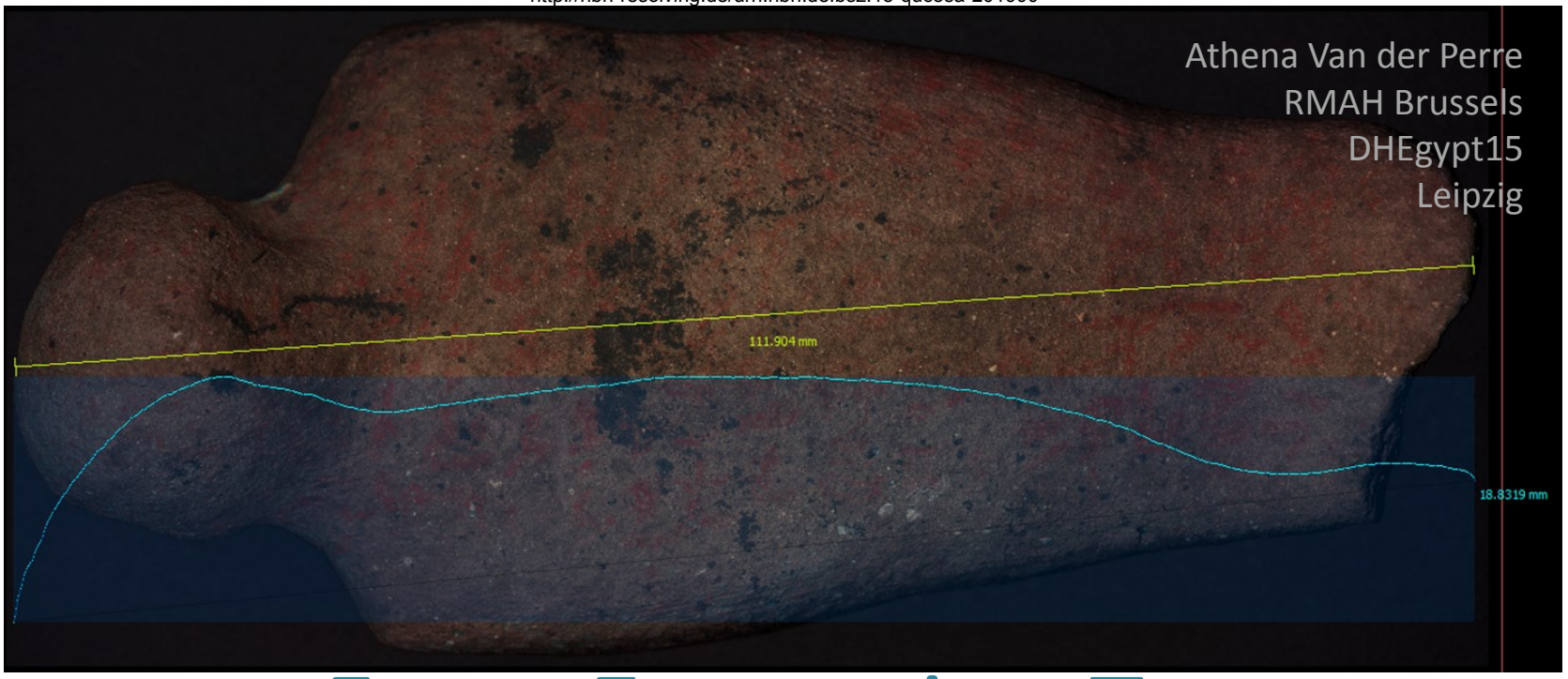

From Execration Texts to Quarry Inscriptions

Combining IR, UV and 3D-Imaging for the Documentation of Hieratic Inscriptions

KU LEUVEN
Belgian Science Policy Office
belspo
fwo Research Foundation Flanders
Opening new horizons

The Egyptian Execration Statuettes (EES) Project

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& Ghent University
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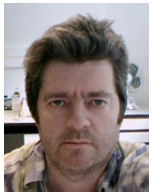

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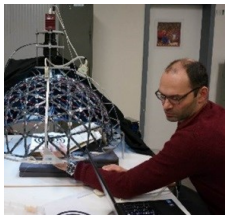

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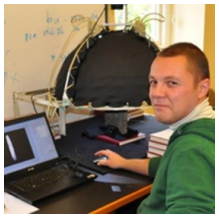

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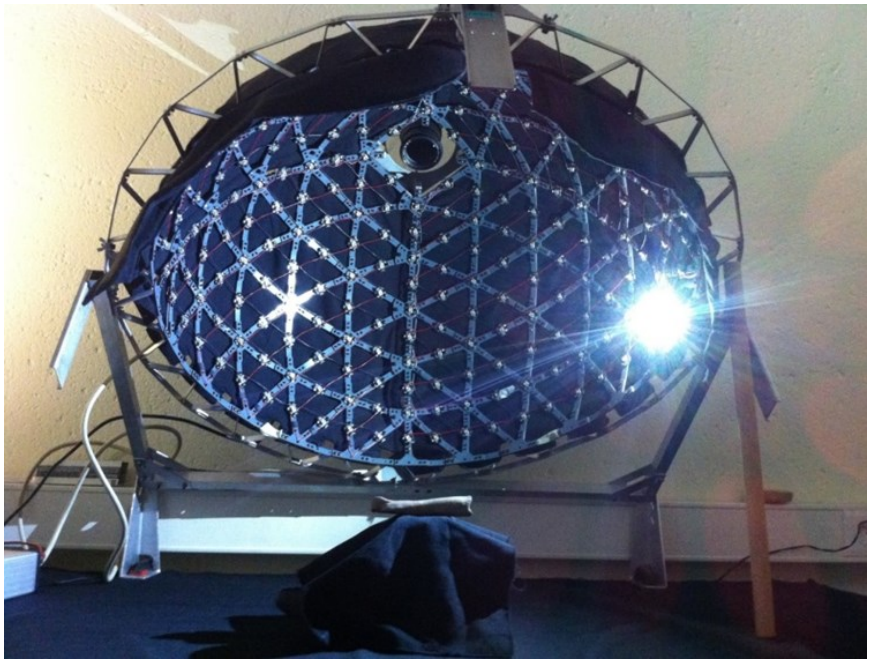
http://nbn-resolving.de/urn:nbn:de:bsz:15-qucosa-201900

EES Project

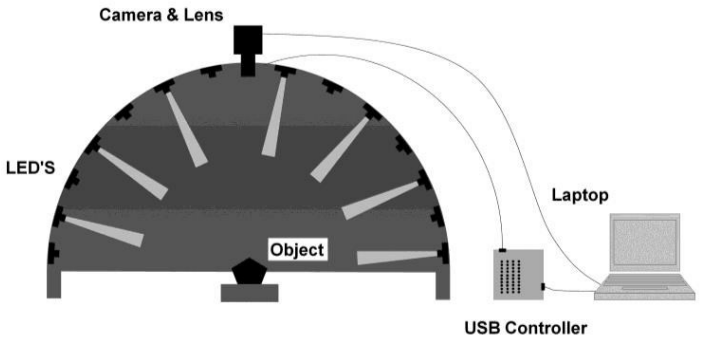
- "Conservation, IR, UV, and 3D-Imaging:
  The Egyptian Execration Statuettes (EES) Project"
- Development multispectral dome
  - Royal Museums of Art and History (RMAH) Brussels
  - ESAT KU Leuven
  - Digital Lab KU Leuven
  - RICH Project (KU Leuven)
- Multispectral 3D digitalisation
- Conservation and study of small decorated and/or inscribed objects
  - E.g. ostraca, papyri, tablets, bowls,…
- Funded by Brain-be Pioneer (Belgian Science Policy Office BELSPO): BR/121/PI/EES

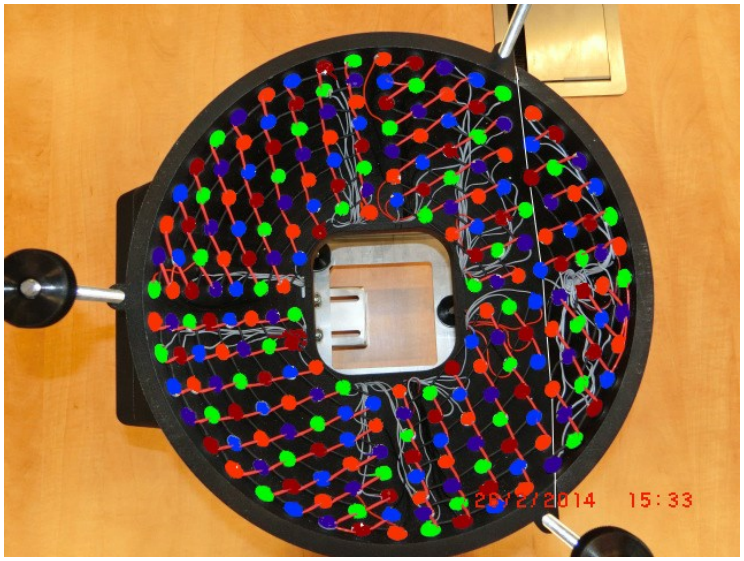
http://www.kmkg-mrah.be/conservation-ir-uv-and-3d-imaging-egyptian-execration-statuettes

Multispectral Minidome



Based on the Portable Light Dome (PLD):
https://portablelightdome.wordpress.com

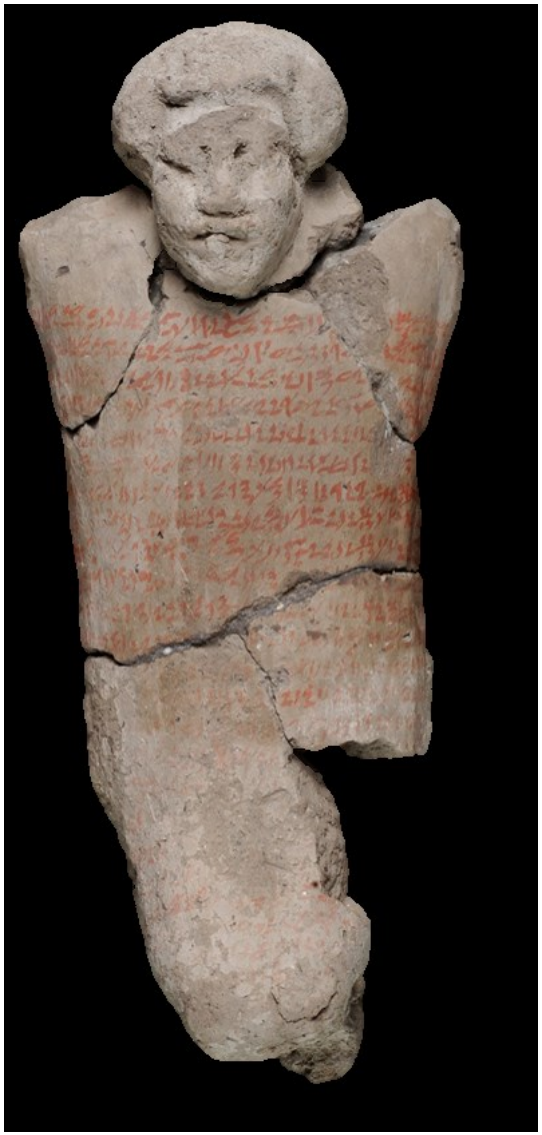




Spread of the MS LED's inside the MS microdome prototype © RICH Project, KU Leuven

Case study 1

- Egyptian Execration Figurines
  - Middle Kingdom (12th Dynasty)
  - < Saqqara
    - Teti Pyramid Cemetery
    - Excavations Firth & Gunn 1921-1922
  - Representing bound (foreign) prisoners
  - Hieratic execration texts
    - Black
    - Red ochre



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POSENER, G. and B. VAN DE WALLE, *Princes et pays d'Asie et de Nubie. Textes hiératiques sur des figurines d'envoûtement du Moyen Empire suivis de remarques paléographiques sur les textes similaires de Berlin, par B. van de Walle (*Brussels, 1940).

http://nbn-resolving.de/urn:nbn:de:bsz:15-qucosa-201900

Preliminary Results

- MS Microdome images
  - No additional post-processing
- Enhancing red ochre paint
  - Illegible text can be reconstructed

msy n Sn-wsr.t
(He who is) born for Sesostris

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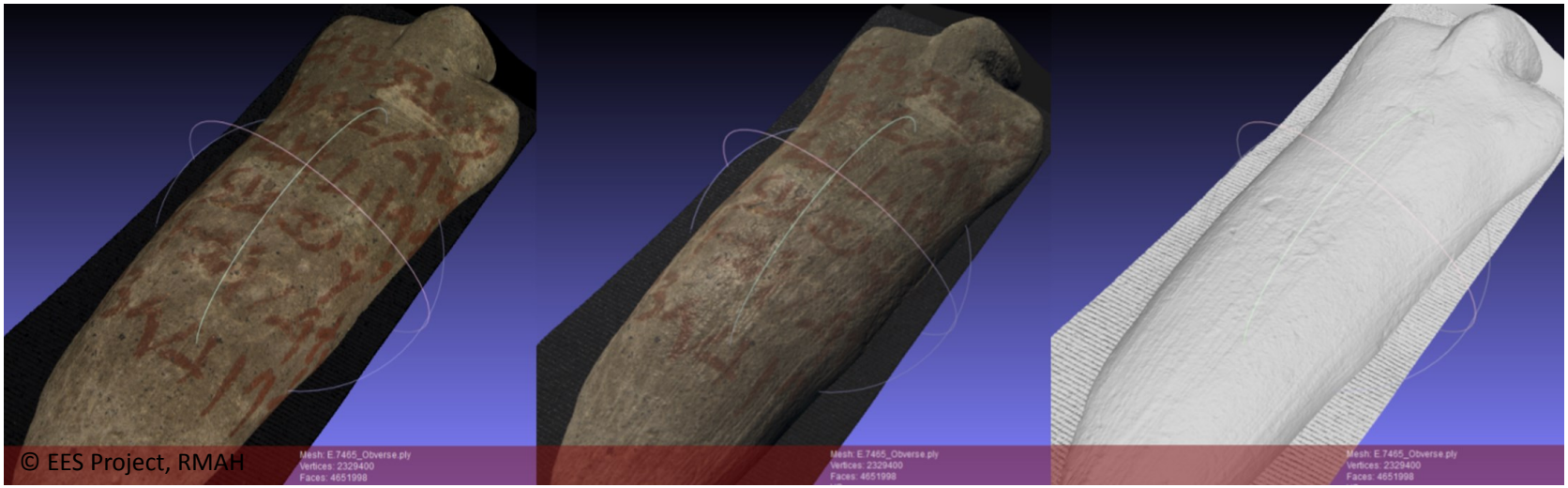
PLD Viewer



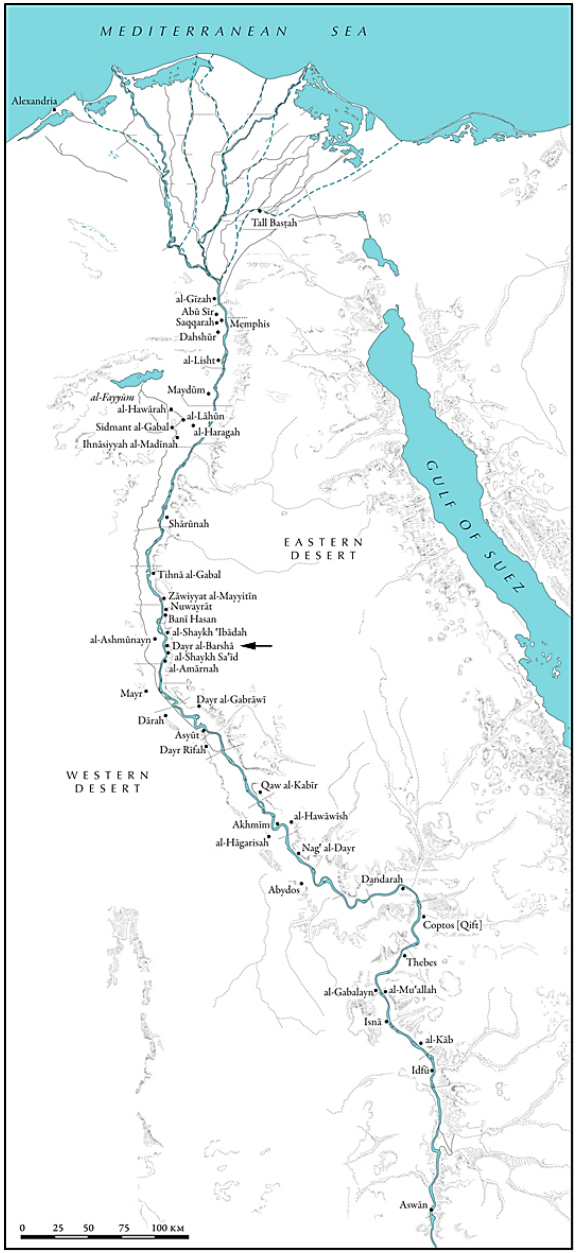
Based on the Photometric Stereo datasets, 3D models of all recordings can be generated at any moment

→ Raw data-set of 2,79 GB (with 29MP camera)
→ computed into working file of 49 MB
→ generated into a 256 MB 3D model with 26.2 million faces

More information:

- Online:
  - http://www.kmkg-mrah.be/conservation-ir-uv-and-3d-imaging-egyptian-execration-statuettes
  - https://portablelightdome.wordpress.com
  - http://www.illuminare.be/rich_project
  - http://greatermesopotamia.be/network/work-package-vi/index.html

- Print:
  - HAMEEUW, H. and G. WILLEMS, New Visualization Techniques for Cuneiform texts and Sealings, *Akkadica* 132/2, 163-178.
  - VAN DER PERRE, A. and H. HAMEEUW, 'La création d'images multi-spectrales: les portraits romains du Fayoum', in: Delvaux, L. and I. Therasse, *Sarcophages. Sous les étoiles de Nout.* (Brussels, 2015), 164-165.
  - VAN DER PERRE, A., HAMEEUW, H., BOSCHLOOS, V., DELVAUX, L., PROESMANS, M., VANDERMEULEN, B., VAN GOOL, L. and L. WATTEEUW, 'Towards a combined use of IR, UV and 3D-imaging for the study of small inscribed and illuminated artefacts', in: Proceedings International Congress Lights On... Cultural Heritage and Museums! Porto, July 2015 (forthcoming May 2016).



Dayr al-Barsha Project

The Dayr al-Barsha Project (2002-present) is an international and interdisciplinary research endeavor directed by the **Egyptology department** at **Leuven University, Belgium.**

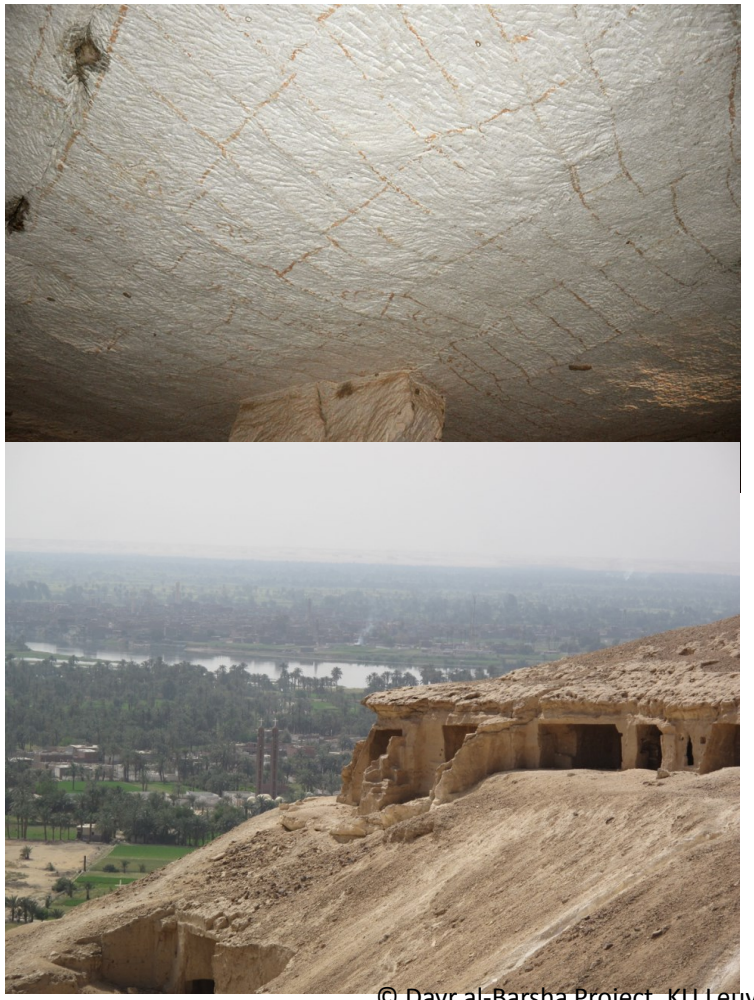
http://www.dayralbarsha.com

Project Director: Harco Willems

Vice Director: Marleen De Meyer

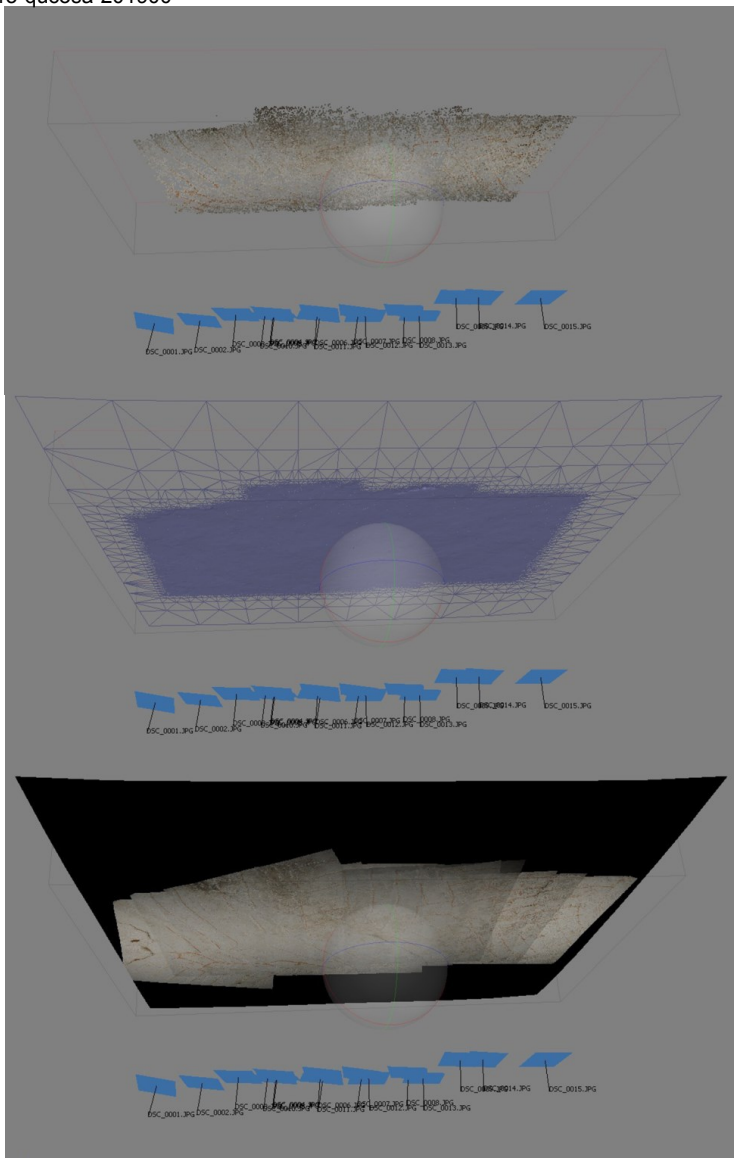
Case study 2

- Limestone gallery quarries at Dayr Abu Hinnis
  - Amarna Period
  - Exploitation of talatat blocks
  - Hieratic inscriptions on ceiling
- Documentation and study of inscriptions and chisel marks



Agisoft PhotoScan

- Collaboration KU Leuven and Ghent University (Rudi Goossens, Marijn Hendrickx, Cornelis Stal)
- Ceiling map based on 3D models
- Structure from Motion (SfM)
  - Extracts the camera motion from a series of overlapping 2D images
    - Feature points
    - Point cloud
    - Camera position
    - Camera parameters



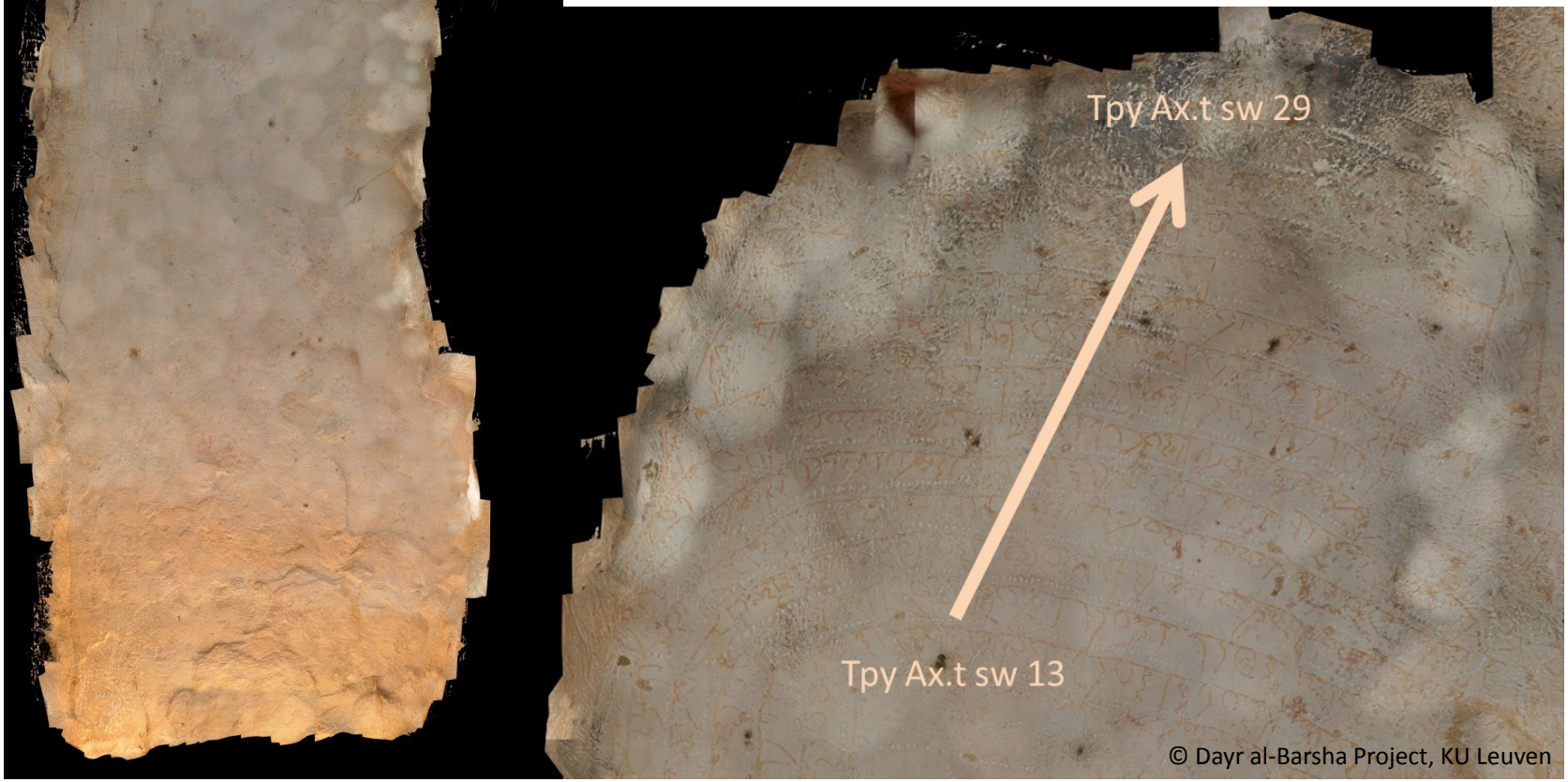
Verhoeven, G., 2011. 'Taking computer vision aloft. Archaeological three-dimensional reconstructions from aerial photographs with PhotoScan', *Archaeological Prospection* 18 (1), 67–73.

http://nbn-resolving.de/urn:nbn:de:bsz:15-qucosa-201900

Ceiling of Quarry 003

Dayr Abu Hinnis, Zone B

- Work Progress (Hieratic dates)
- Direction of exploitation (chisel marks and inscriptions)
- Exploitation techniques (chisel marks)



More information:

- Online:
  - http://www.dayralbarsha.com

- Publications:
  - VAN DER PERRE, A., 'Quarry Marks of the Amarna Period: The Limestone Quarries of Dayr Abu Hinnis', in: J. BUDKA, F. KAMMERZELL and S. RZEPKA (eds.), *Non-Textual Marking Systems in Ancient Egypt (and Elsewhere)*, Lingua Aegyptia. Studia Monographica 16 (Hamburg, 2015), 69-80.
  - VAN DER PERRE, A. (forthcoming), *Stone for Amarna*, Orientalia Lovaniensia Analecta (Leuven). [Publication of dissertation, Accepted]

Questions?

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- athena.vanderperre@kuleuven.be