



**Presentation at DC meeting
in Brussels 12-13 March 2007**



**COST ACTION E32
Characterisation of paper surfaces
for improved printing paper grades**

**Sissel Ravnsborg
Chair**



COST ACTION E32



Chair: Sissel Ravnsborg, Norway
Vice Chair: Elena Bobu, Romania
Leader WG 1: Göran Ström, Sweden
Leaders WG2:
Until 1.3.06: Marjatta Kleen, Finland
From 1.3.06: Jouko Peltonen, Finland

Home page:
<http://www.pfi.no/gary/COSTE32.htm>



COST ACTION E32



Start: October 2003
End: October 2007
17 countries



COST ACTION E32 Background



**Paper surface chemistry and topography
determine print quality**

**Competition from other media
and customer demands**



Need for increased know-how on paper surface



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Main objectives



To develop and improve methods for analysis of printing paper surfaces in order to improve print quality. Further, it is also of interest to develop methods that can measure ink distribution on printed surfaces and correlate this to the local topography and chemistry.



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Specific objectives



- **To create a platform for interaction between scientists and papermakers in Europe to provide a good transfer of knowledge**
- **To define present knowledge of the influence of paper structure and chemistry on the obtainable print quality for different printing processes**
- **To identify knowledge gaps and suggest relevant research**



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Outcome and achievements

**Working Group meetings in
Amsterdam, Trondheim, Helsinki,
Cornwall, Budapest, Ljubljana**

**Symposium in Madrid
6-7 October 2005**

**73 participants, many of them from
printing industry and paper producers**



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Outcome and achievements

STSMs:

- **From Hungary to Norway:** Morphological studies on fibres and paper by scanning electron microscopy
- **From Hungary to France:** Mechanical, optical and surface testing methods to characterize printing papers
- **From Romania to Slovenia:** Correlation between the coating layer structure and paper characteristics
- **From Slovenia to Finland:** Image analysis based methods for evaluation of paper structure and print quality



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Outcome and achievements

STSMs, cont.:

- **From Croatia to Norway:** Scanning electron microscopy methodology applied to paper as a printing substrate
- **From Portugal to Finland:** Evaluation of the chemical properties of the surface of different uncoated paper samples with two surface size treatments
- **From Slovenia to Germany:** Digital optical measurement and analysis system, PTS-DOMAS



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Outcome and achievements



Sharing knowledge and making improvements on analytical techniques, like:

- **Atomic Force Microscopy:** Surface topography
- **Laser profilometry:** Surface topography
- **Modified Bentsen roughness:** Surface topography
- **Image analysis:** Surface topography
- **Scanning Electron Microscopy:** Surface topography
- **ESCA and TOF-SIMS:** Surface chemistry
- **Inverse Gas Chromatography:** Surface chemistry
- **SIMS and XPS:** Ink component distribution
- **Refractometry and polarized light:** Paper coating structure

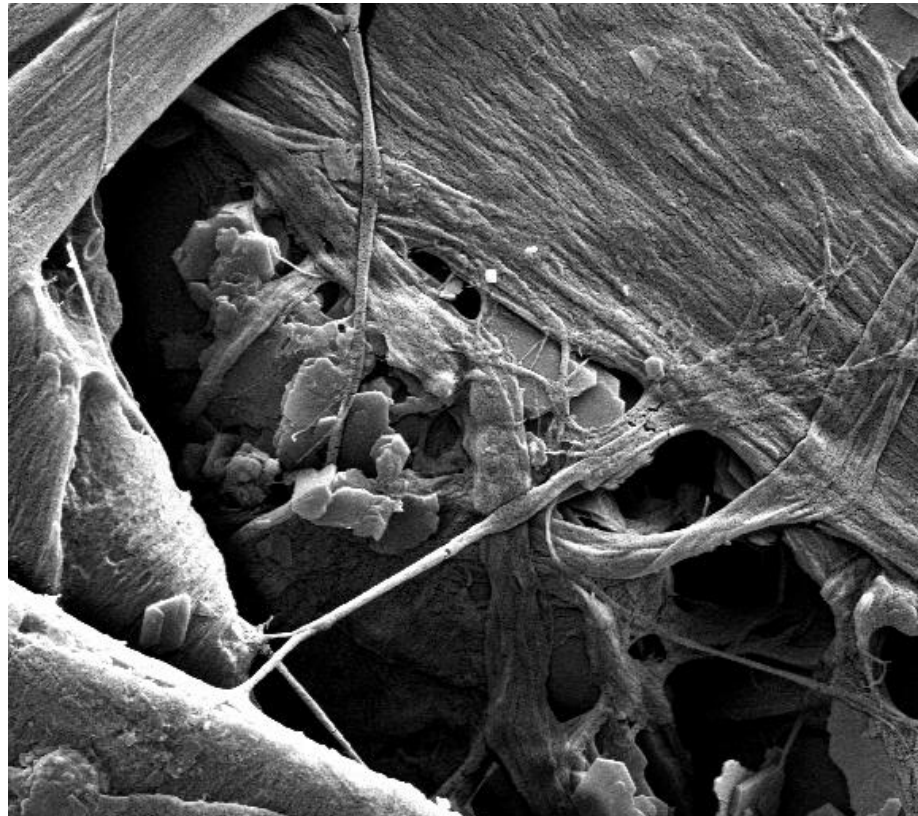


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Some examples



SEM,
for quantification of micro-fibrils



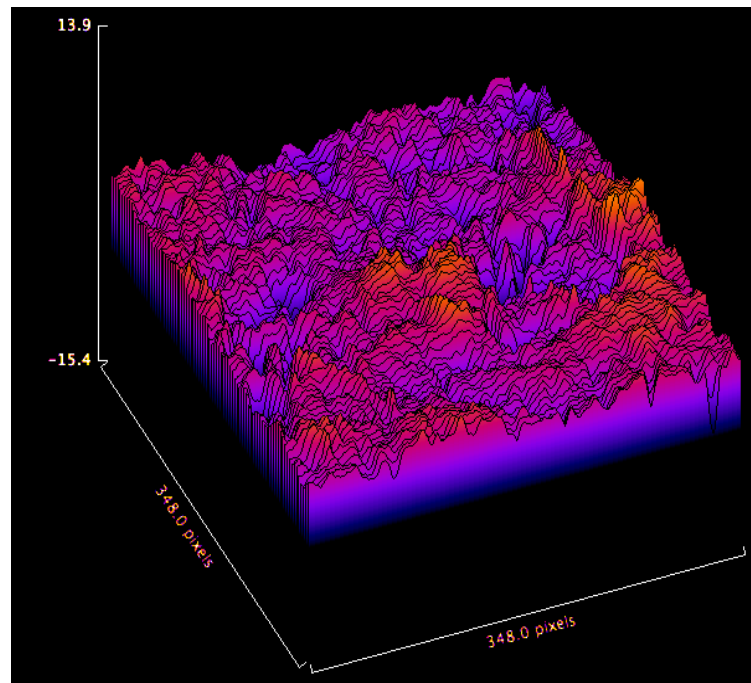


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Some examples



Laser profilometry,
for surface topography



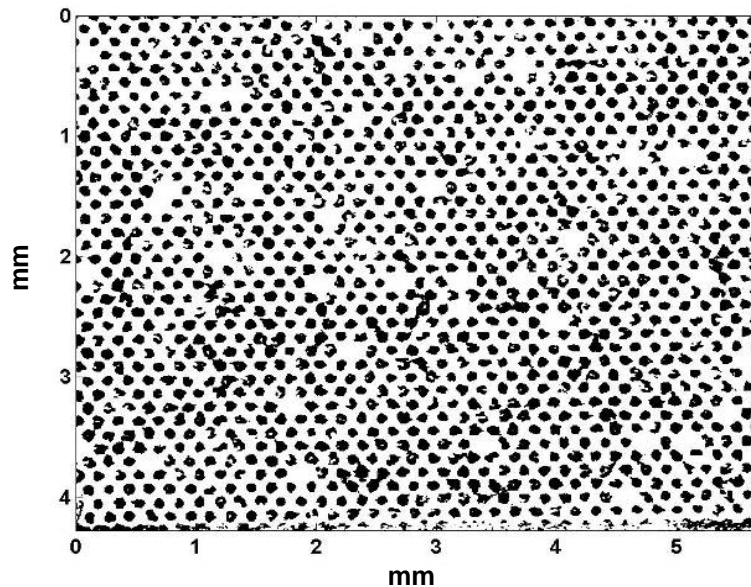


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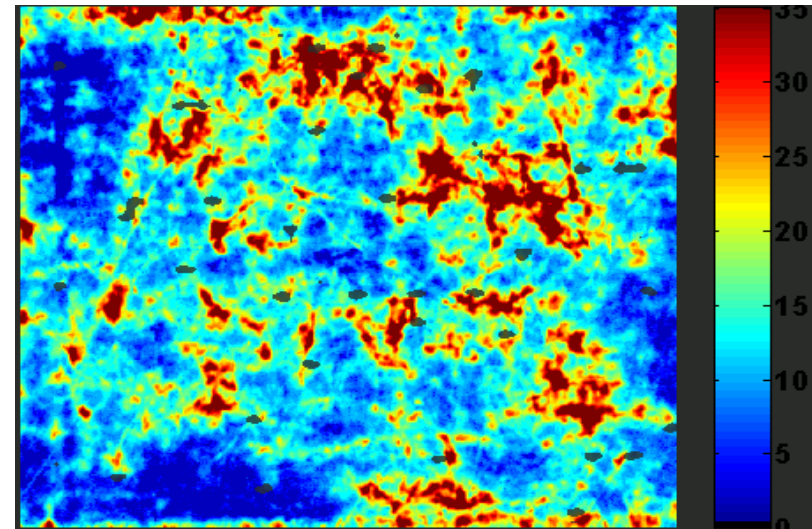
Some examples



Maps of local stress and relation to missing dots in rotogravure printing



Printed image



Impression of same area on pressure sensitive film

Missing dots are located close to an area which take up high local stress. Red is high and blue is low stress



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Outcome and achievements

Strengths:

High scientific quality

Good atmosphere with confidence and willingness to contribute and share knowledge instead of compete



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Outcome and achievements

Weakness:

Insufficient dissemination of results to industry

**(probably because of industry's
short-term focus on economical aspects)**

**Financial uncertainty
in the first period of the Action**



COST ACTION E32 Impact of the Action

**Important knowledge on
characterisation of paper surface
and understanding how surface
properties affect print quality**

**Contributions are documented
on the home page**



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Coordination and management

Each meeting is divided into:

- **Presentation of novel characterisation techniques**
- **Presentation and discussion of a certain printing technology (e.g. digital printing or offset printing)**
- **Discussions on the importance of various paper properties for this printing technology**
- **Presentation of STSMs**



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Coordination and management

**Top score for management
at mid-term evaluation**



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Future activities



**Working Group meetings in
Brasov, Romania
May 2007**

**Closing conference in
Grenoble, France
October 2007**



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Dissemination of results



**Even unpublished results are discussed
during the meetings**

**Knowledge on techniques not previously
used in home laboratory through STSMs**



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Dissemination of results
cont.



**Contributions by the participants are documented
and filed on the home page**

**Proceeding books from the seminar in Madrid 2005
and the closing conference in Grenoble 2007**

**Lists of suitable instruments and literature are
gathered and continuously updated**



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Thank you for your attention