



Microtexture and friction

Presented by Alan Dunford
26 November 2008





Independent Transport Research, Consultancy & Testing

Creating the future of transport



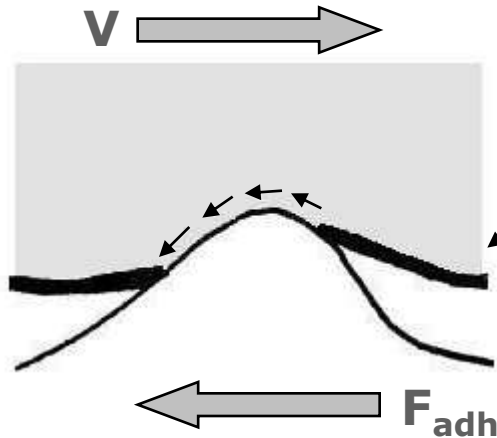
Measuring skid resistance - conventional



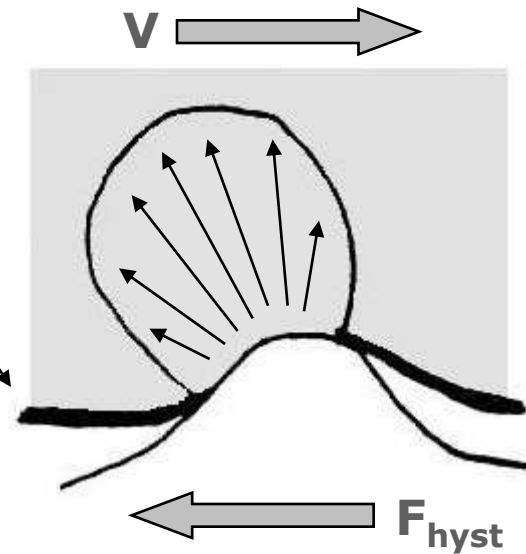
- Rubber wheel or slider forced against a wetted road surface

Friction - hysteresis

Adhesion



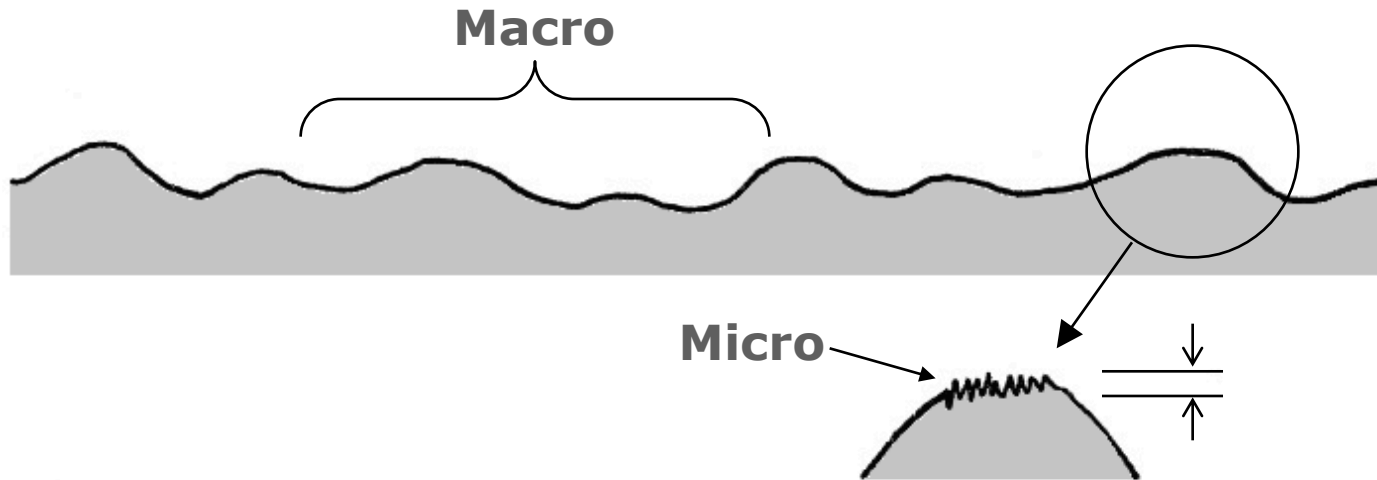
Hysteresis



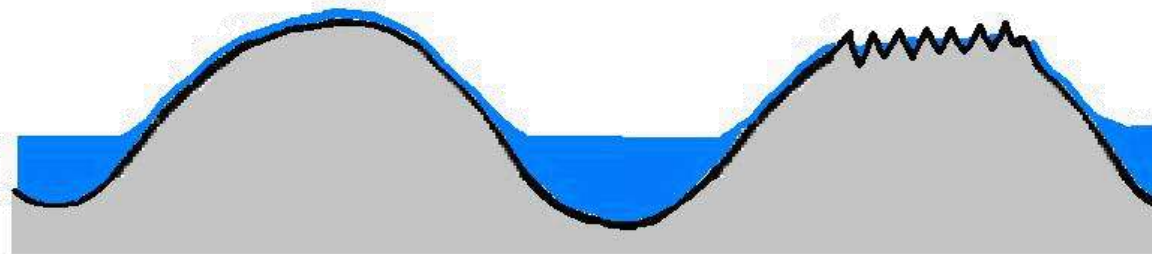
Tyre

- Deformation of tyre over surface asperity
- Asymmetrical pressure distribution -> Friction

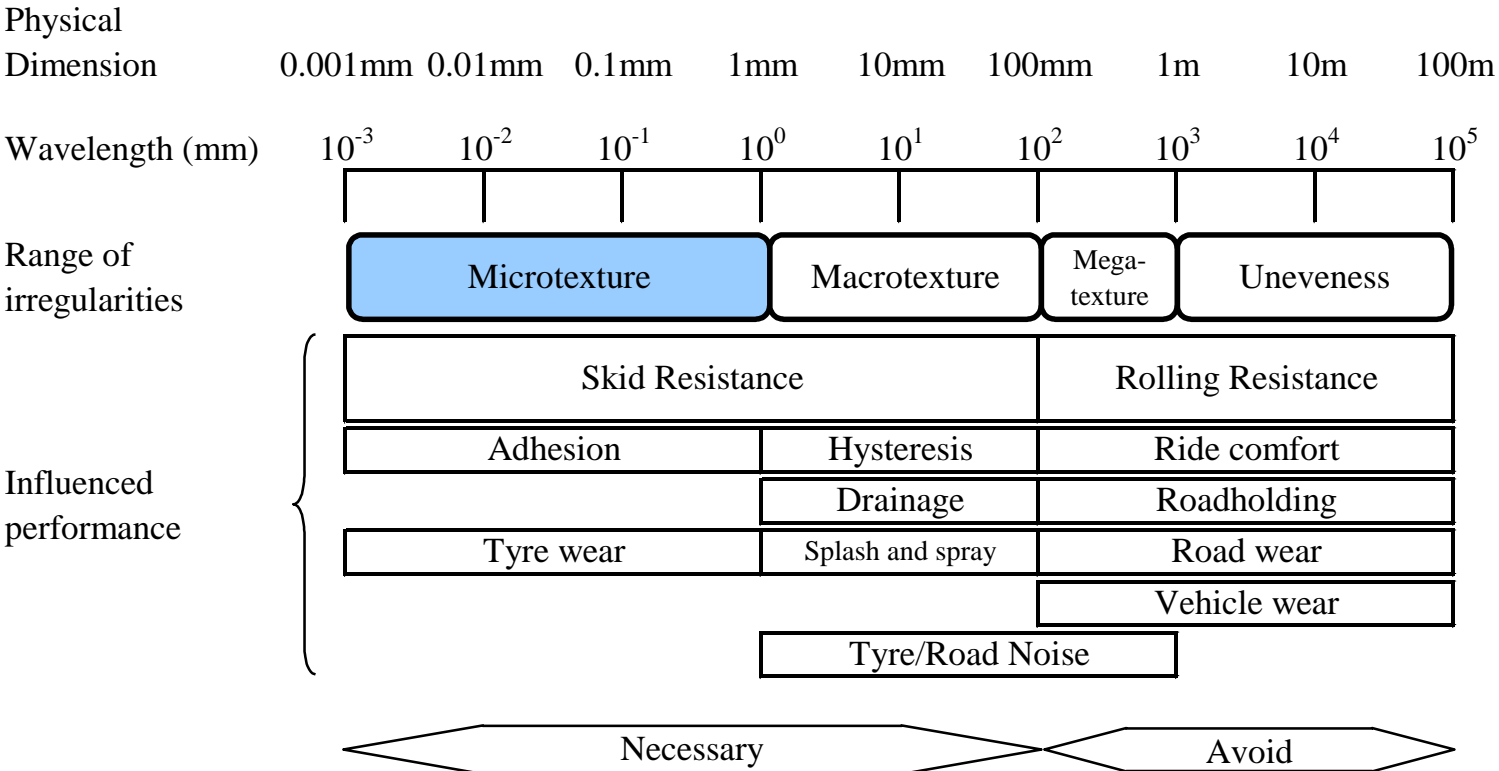
Surface texture – Macro/Micro



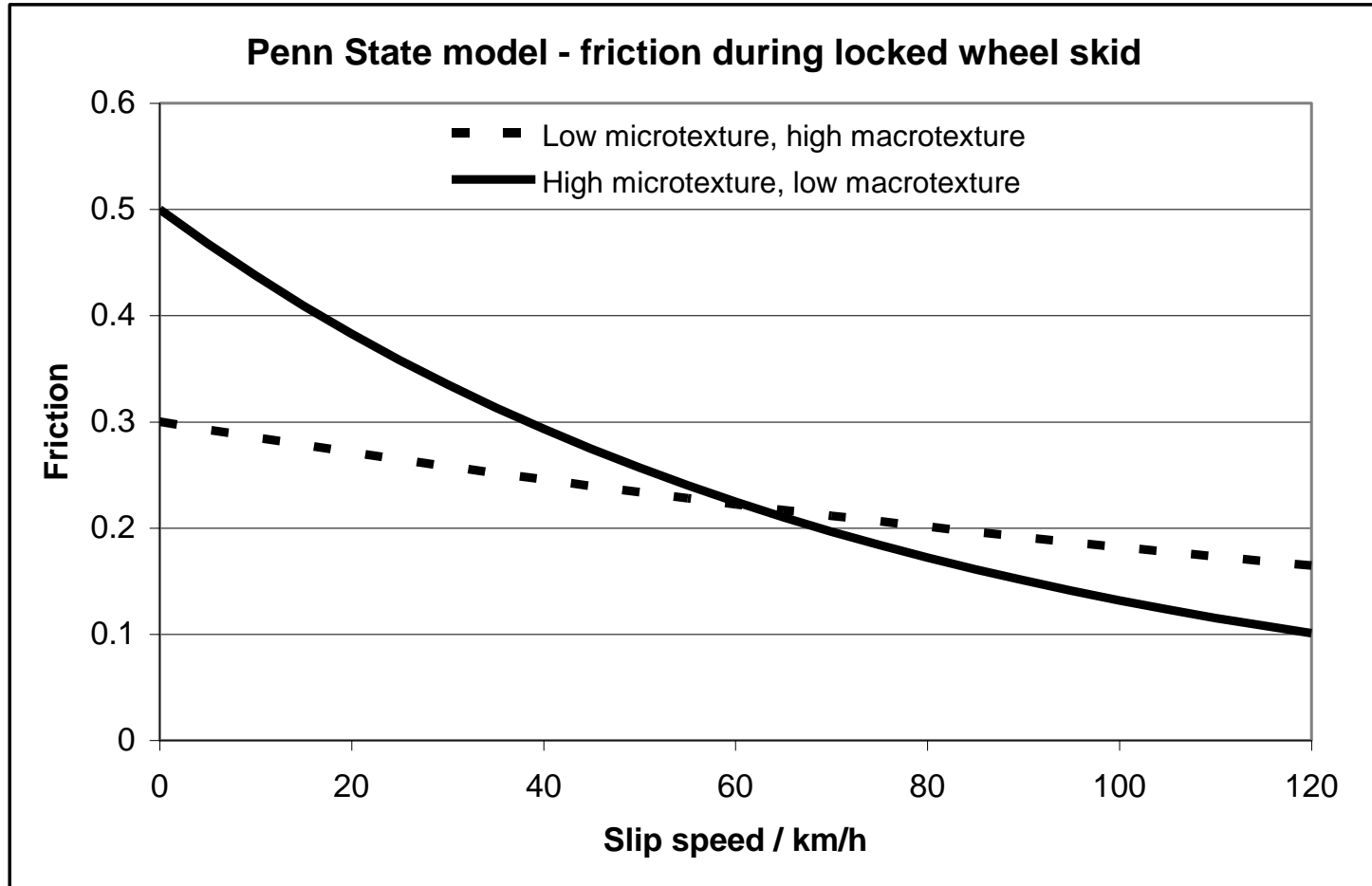
- Macrotexture -> Drainage and hysteresis
- Microtexture -> Adhesion



Surface texture - Scales



Friction, speed and texture



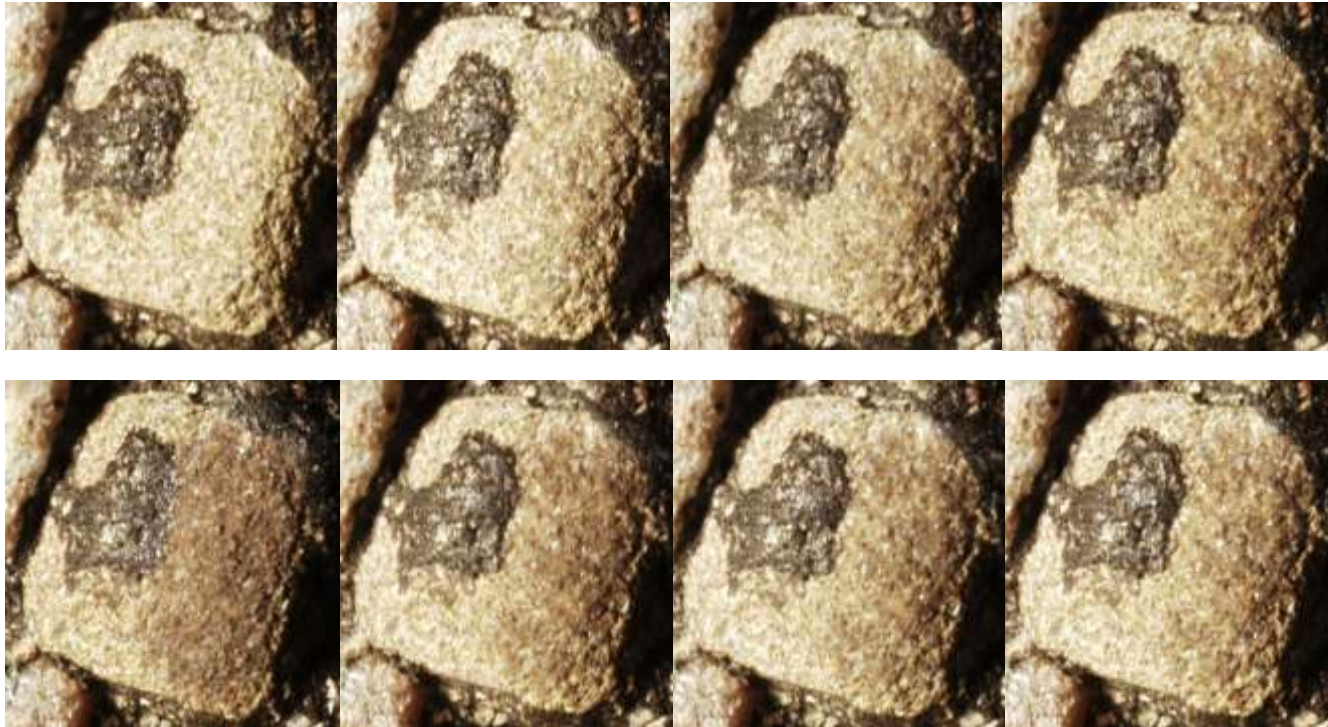
Measuring skid resistance – future possibilities

- High resolution images
- Variation in pixel intensity related to roughness?



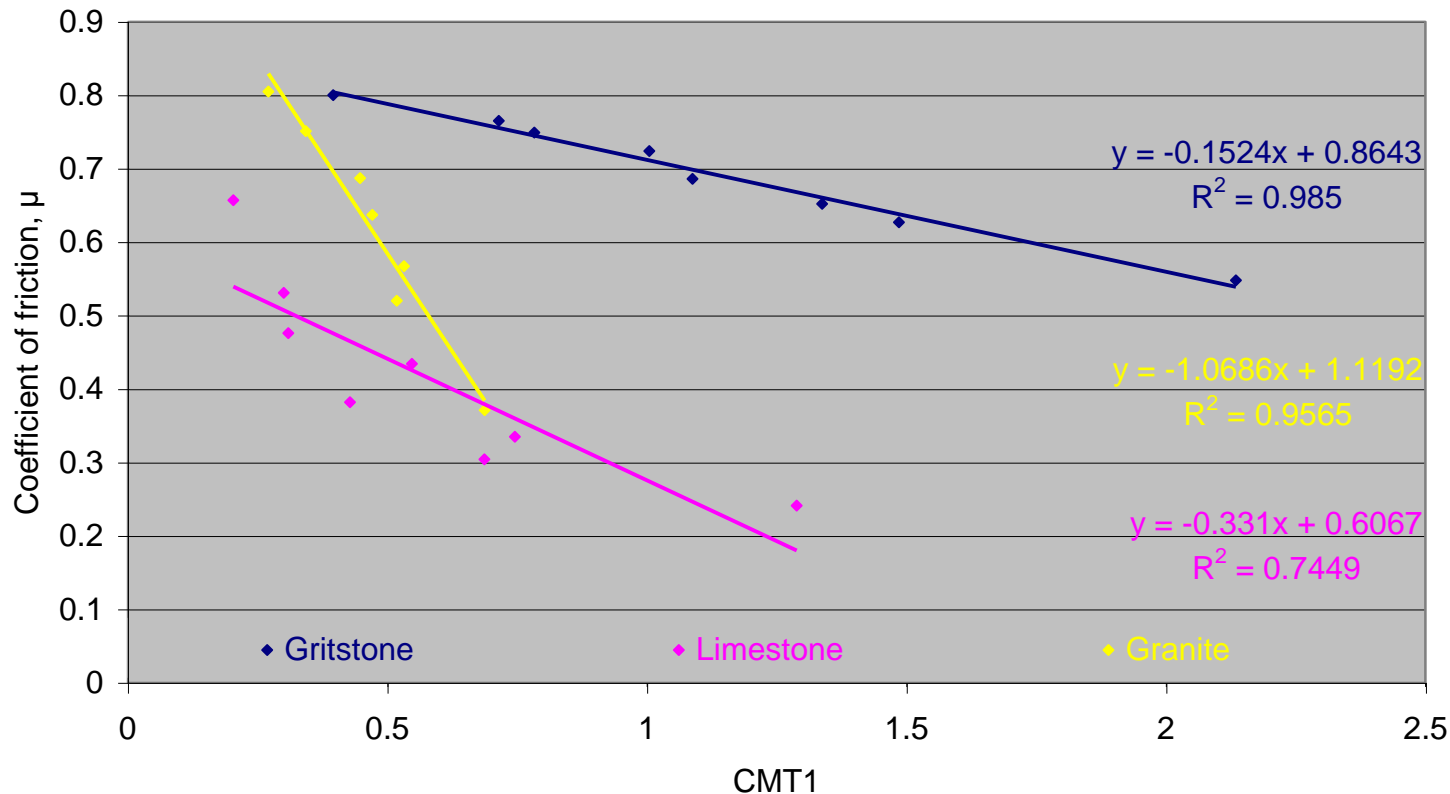
Experiment - Gradual polishing and image analysis

- Photographs of aggregates through stages of polishing/friction



Results of image analysis

- Friction at each stage of polishing vs. image parameter
 - “CMT1” calculated from intensity variation, based on threshold levels



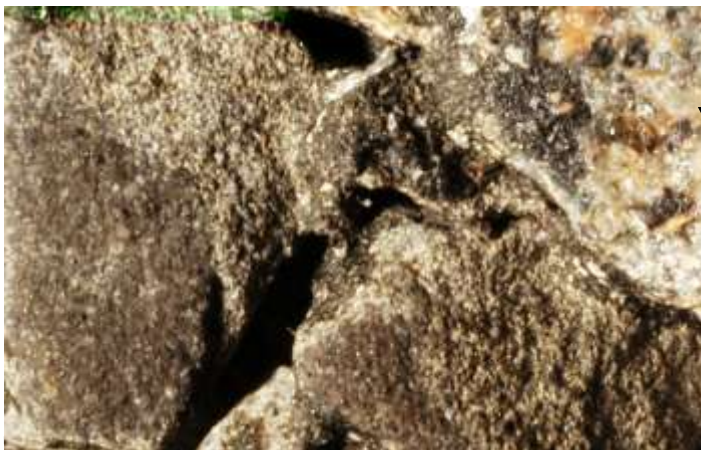
Also need to consider polishing mechanisms

- Gritstone

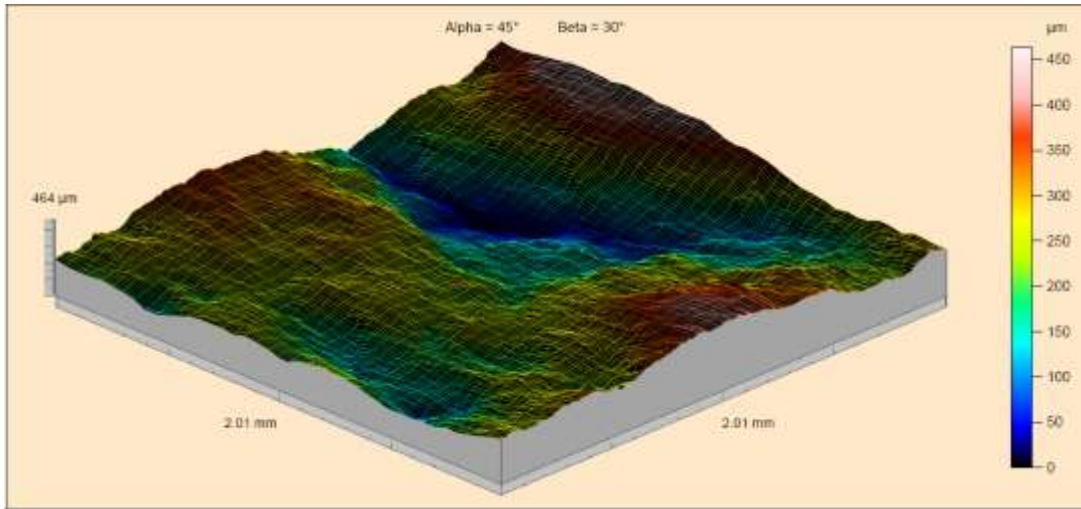
- Granite



Polishing



Actual surface texture measurements – Laser profiles



Gritstone

Granite

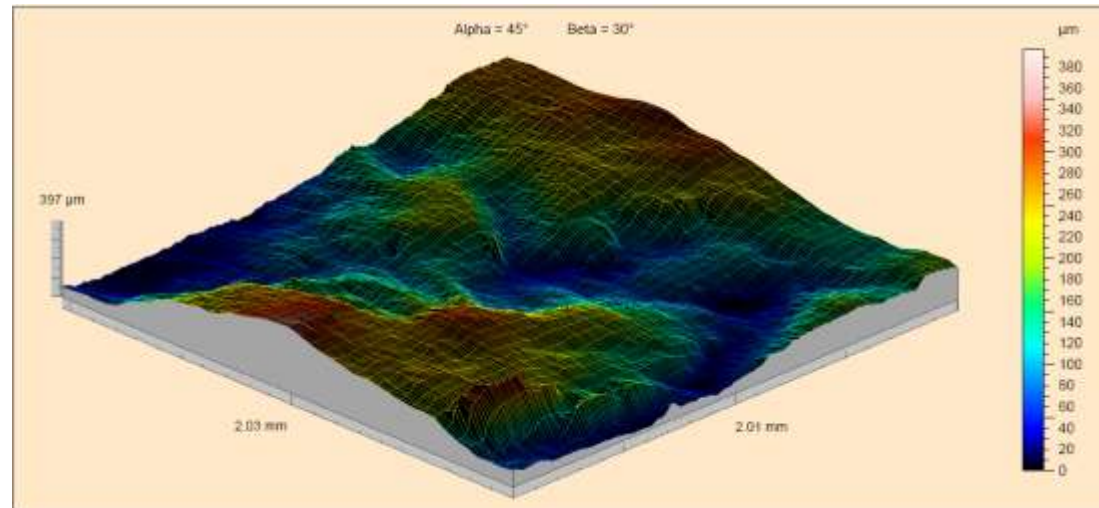
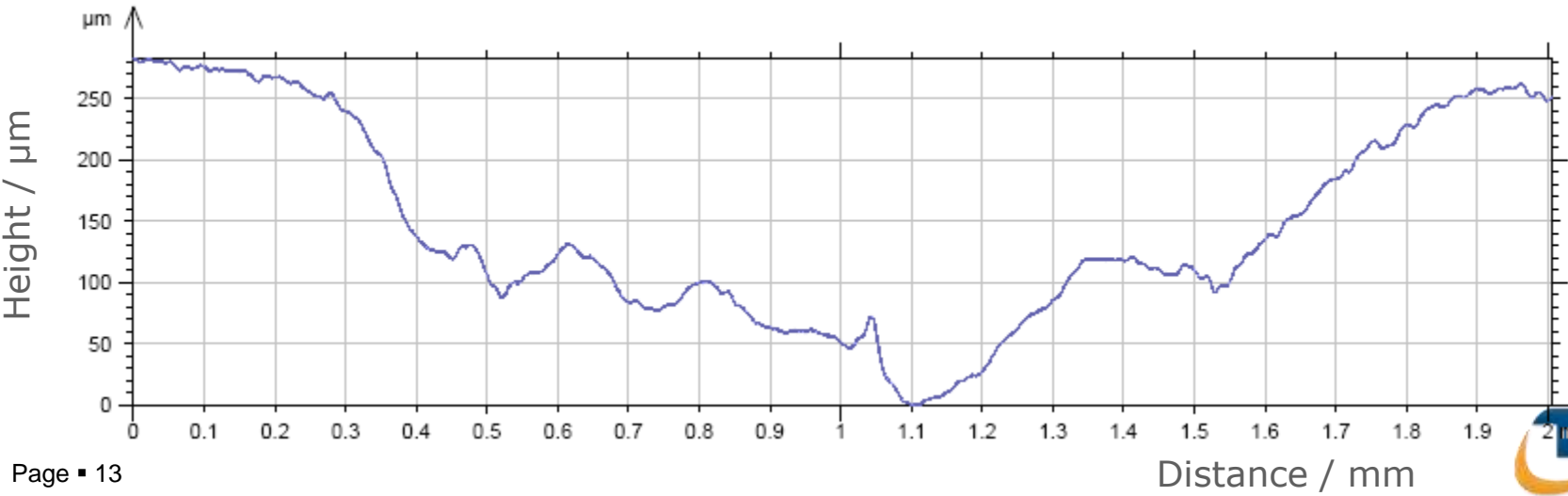
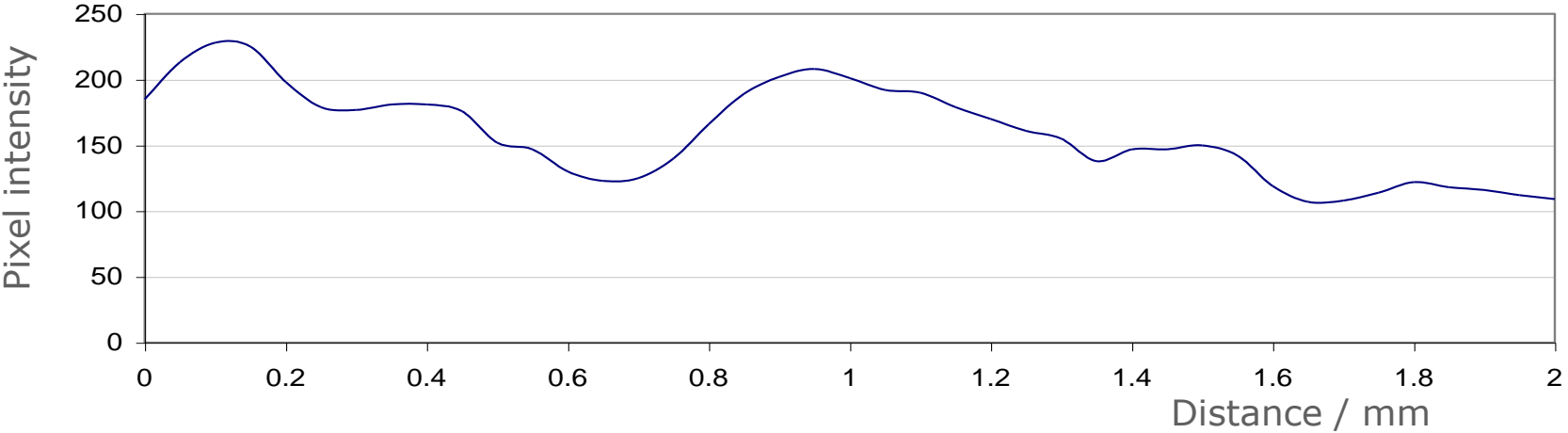


Image intensity variation vs laser profiles

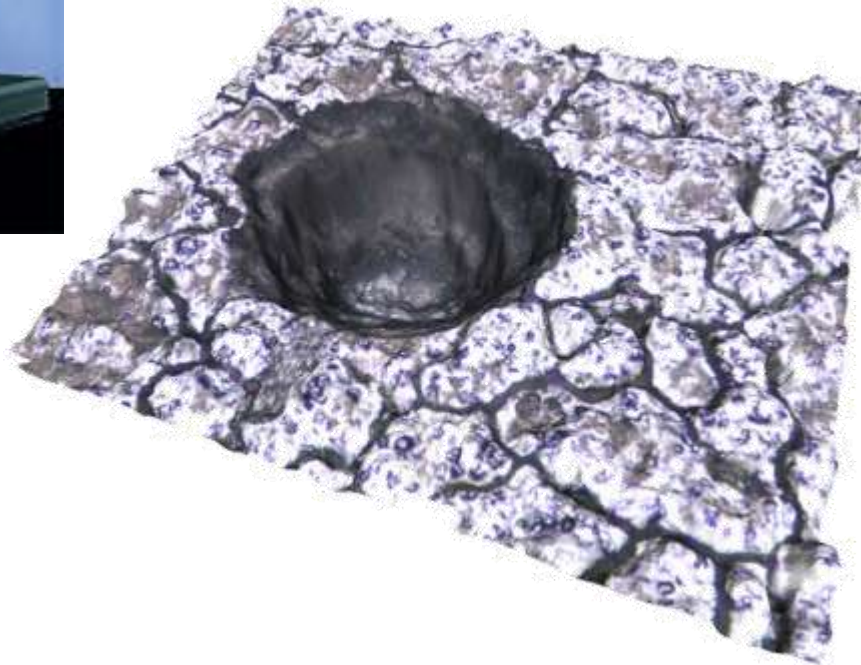


Actual surface texture measurements – InfiniteFocus

INFINITEFOCUS



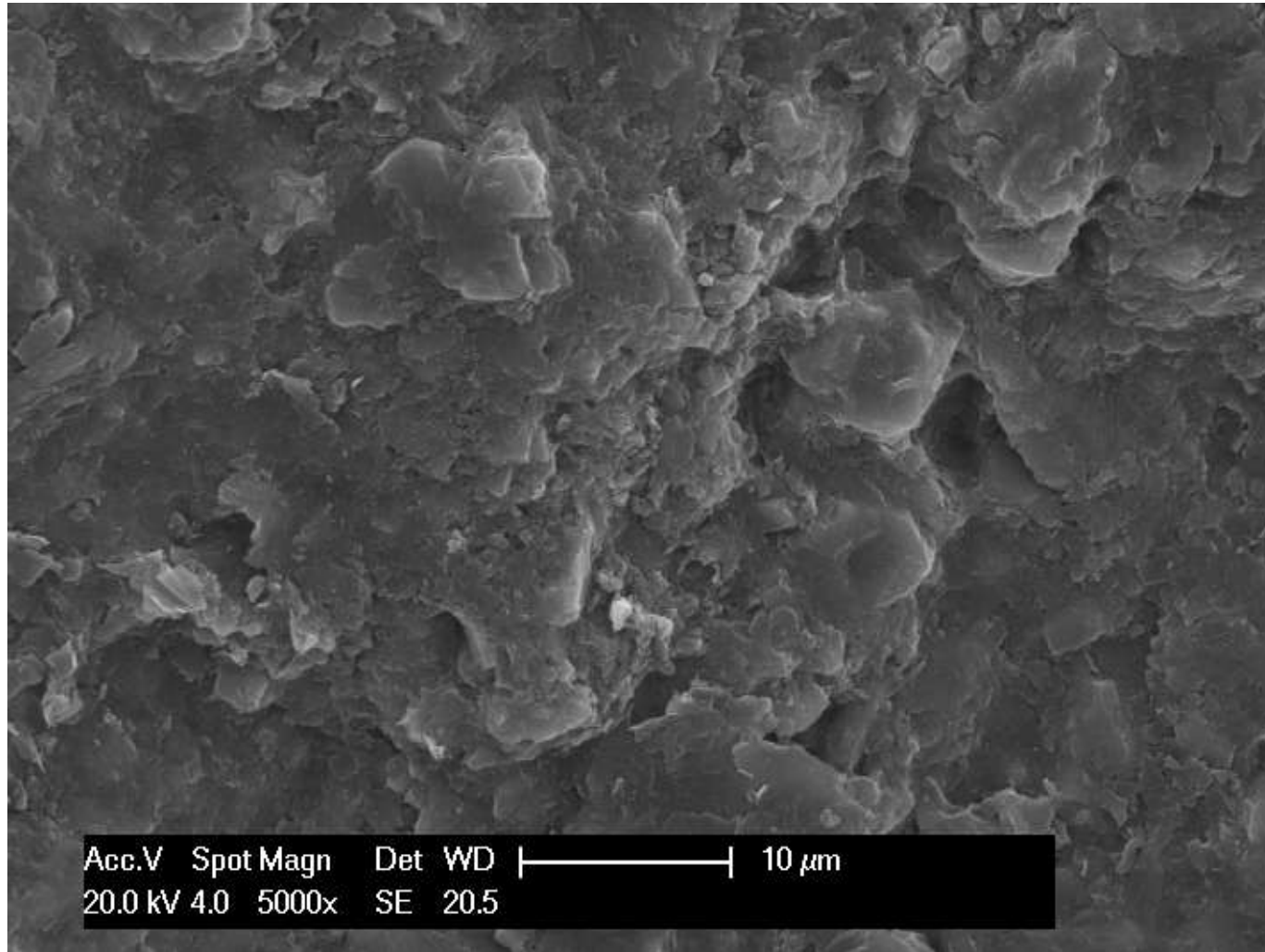
- Fast process, with “3D” images
- Use surface replication technique
- Actual measurements of surface roughness through stages of polishing/friction



SEM (granite)



SEM (gritstone)





Do You Have Any Questions?

Thank you

Microxture and friction

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