Consultative Committee for Length – CCL

Discussion Group on Surface Texture – DG8

12 June 2018

DG8 report to CCL, 2018

BIPM, Sèvres (FR)

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Discussions

No technical discussions have been undertaken in the period since the last CCL meeting.

Comparison activities

Completed intercomparisons

- APMP.L-K8 Final Report, Metrologia, 2013, 50, Tech. Suppl., 04003
- SIM-EURAMET.L-K8.2009, Metrologia, 2016, 54, Tech. Suppl. 04001
- EURAMET.L-K8.2013, Metrologia, 2015, 53, Tech. Suppl., 04001
- COOMET.L-S13 Final Report, 2015, Metrologia, 2015, 52, Tech. Suppl., 04012 (bilateral)

Planned intercomparisons

- CCL.K8 planned from 2019?
- APMP.L-K8 planned from 2020?
- Other?

Consideration can be made over which measurement techniques are allowed in any particular intercomparison where instrument ranges overlap. Suggestion for pilot study to examine different methods (eg, profilometry, AFM, optical microscopy, XCT, etc) that have range overlap. Need for volunteer pilot and artefacts.

Recent published/discovered papers (not conclusive list)

Liu M Y, Cheung C F, Feng X, Wan C J, Leach R K 2018 A self-calibration rotational stitching method for precision measurement of revolving surfaces *Prec. Eng.* in press

Senin N, Leach R K 2018 Information-rich surface metrology *Proc. CIRP* in press

Syam W P, Leach R K, Rybalcenko K, Gaio A, Crabtree J 2018 In-process measurement of the surface quality for a novel finishing process for polymer additive manufacturing *Proc. CIRP* in press

Feng X, Su R, Happonen T, Liu J, Leach R K 2018 Fast and cost-effective in-process defect inspection for printed electronics based on coherent optical processing *Opt. Express* 26 13927-13937

Cheung C F, Liu M, Leach R K, Feng X, Zhao C 2018 Hierarchical-information-based characterization of multiscale structured surfaces *Ann. CIRP* in press

Aburayt A, Syam W P, Leach R K 2018 Lateral scale calibration for focus variation microscopy *Meas. Sci. Technol.* 29 065012

Maculotti G, Feng X, Galetto M, Leach R K 2018 Noise evaluation of a point autofocus surface topography measuring instrument *Meas. Sci. Technol.* 29 065008

Thompson A, Senin N, Maskery I, Leach R K 2018 Effects of magnification and sampling resolution in X-ray computed tomography for the measurement of additively manufactured metal surfaces *Prec. Eng.* in press

Thompson A, Senin N, Maskery I, Körner L, Lawes S D A, Leach R K 2018 Internal surface measurement of metal powder bed fusion parts *Additiv. Manuf.* 20 126-133

Moroni G, Syam W P, Petrò S 2018 A simulation method to estimate task-specific uncertainty in 3D microscopy *Measurement* 122 402-416

Su R, Thomas M, Leach R K, Coupland J M 2018 Effects of defocus on transfer function of coherence scanning interferometry *Opt. Lett.* 43 82-85

Vaithilingham J, Saleh E, Körner L, Wildman R D, Hague R J, Leach R K, Tuck C J 2018 Three-dimensional inkjet printing of macro structures from silver nanoparticles *Materials & Design* 81-88

Senin N, Thompson A, Leach R K 2018 Feature-based characterisation of signature topography in laser powder bed fusion of metals *Meas. Sci. Technol.* 29 045009

Nicola Senin, Adam Thompson and Richard K Leach Characterisation of the topography of metal additive surface features with different measurement technologies, 2017 Meas. Sci. Technol. 28 095003

I M Smith, P M Harris, L D Todhunter, C Giusca, X Jiang, P Scott and R K Leach Algorithms and software for areal surface texture function parameters, 2017 Meas. Sci. Technol. 28 105008

S Adamczak, C Kundera and J Swiderski Assessment of the state of the geometrical surface texture of seal rings by various measuring methods, 2017 IOP Conf. Ser.: Mater. Sci. Eng. 233 012031

I N Bobrovskij How to Select the most Relevant Roughness Parameters of a Surface: Methodology Research Strategy, 2018 IOP Conf. Ser.: Mater. Sci. Eng. 302 012066

Townsend A, Racasan R, Blunt L Surface-specific additive manufacturing test artefacts, 2018 Surf. Topogr.: Metrol. Prop. 6 024007

Jeremias Seppä, Karri Niemelä and Antti Lassila Metrological characterization methods for confocal chromatic line sensors and optical topography sensors, 2018 Meas. Sci. Technol. 29 054008

Chenguang Liu, Yan Liu, Tingting Zheng, Jiubin Tan and Jian Liu Monte Carlo based analysis of confocal peak extraction uncertainty, 2017 Meas. Sci. Technol. 28 105016

Xiaolei Zhang, Jie Wang, Xiangchao Zhang, Min Xu, Hao Zhang and Xiangqian Jiang Correction of phase-shifting error in wavelength scanning digital holographic microscopy, 2018 Meas. Sci. Technol. 29 055002

Potential topics for DG8 discussions

Suggested topics may be:

1. Upcoming intercomparisons for maintaining confidence in 2D parameter CMCs.
2. Linking of APMP.L-K8 (2008), SIM-EURAMET.L-K8 (2009) and EURAMET.L-K8 (2013).
3. Application of Areal instruments (optical and stylus) and parameters.
4. Industry needs such as NMI level support for additive manufacturing.
5. Simplification of CMC listings for too many parameters.
6. Intercomparisons for supporting addition of 3D Areal parameters to KCDB (pilot study?).
7. XCT for surface texture measurements.

2018 upcoming events

3rd Dimensional X-ray Computed Tomography Conference .... 2 - 3 July 2018 in Nottingham, UK

6th International Conference on Nanomanufacturing ....4 - 6 July 2018 in London, UK

The International Conference on Additive Manufacturing & 3D Printing .... 10 - 12 July 2018 in Nottingham, UK

4th CIRP Conference on Surface Integrity ....11 - 13 July 2018 in Tianjin, China

euspen's Special Interest Group Meeting: Advancing Precision in Additive Manufacturing
....22 - 25 July 2018 in California, USA

Coordinate Metrology Society Conference 2018 ....23 - 27 July 2018 in Reno, Nevada, USA

29th Annual International Solid Freeform Fabrication Symposium .... 13 - 15 August 2018 in Austin, Texas, USA

68th CIRP General Assembly ....19 - 25 August 2018 in Tokyo, Japan

XXII World Congress of the International Measurement Confederation (IMEKO) ....
....3 - 6 September 2018 in Belfast, UK

6th Tomography for Scientific Advancement (ToScA) symposium .... 10 - 12 September 2018 in Warwick, UK

7th International Conference on Speckle Metrology ....10 - 12 September 2018 in Janów Podlaski, Poland

7th Target Fabrication Workshop .... 17 - 20 September 2018 in Darmstadt, Germany

TOM 6 - Frontiers in Optical Metrology .... 8 - 12 October 2018 in Delft, Netherlands

3rd 3D Metrology Conference 2018 ....16 - 18 October 2018 in Hamburg, Germany

Digitalising Manufacturing Conference 2018 .... 29 - 30 October 2018 in Coventry, UK

33rd Annual ASPE Meeting ....4 - 9 November 2018 in Las Vegas, Nevada, USA

17th International Conference on Precision Engineering .... 12 - 16 November 2018 in Kamakura, Japan

International exhibition and conference on the next generation of manufacturing technologies ....
.... 13 - 16 November 2018 in Frankfurt, Germany

EPMC European Portable Metrology Conference .... 20 - 21 November 2018 in Coventry, UK

euspen's Special Interest Group Meeting: Structured & Freeform Surfaces
....27 - 29 November 2018 in Paris, France

Other notes

None.

Note: Information for papers and events are from the University of Nottingham webpage and IOPScience

Andrew Baker, DG8 moderator

7 June 2018