

BIPM Capacity Building & Knowledge Transfer Programme

2018 BIPM - TÜBİTAK UME Project Placement

REPORT

Project Name	2018 BIPM - TÜBİTAK UME Project Placement
Description	Dimensional Meteorology
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Motivation & Introduction

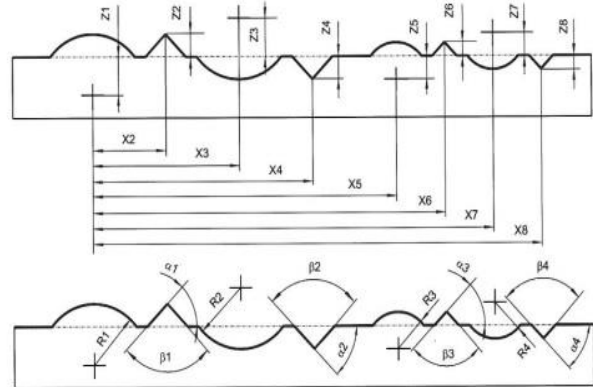
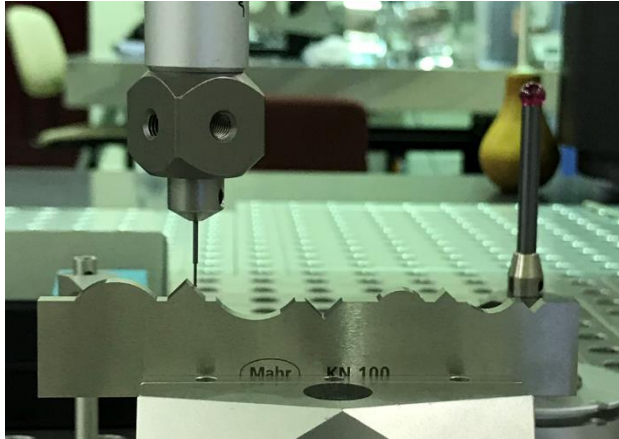
This project aims to develop the technical skills and capabilities of the National Calibration and Measurement Center (SASO-NMCC) researchers / technicians in the dimensional metrology fields by developing in-house knowledge transfer program. This initiative contains NMIs such as TÜBİTAK UME best practices to be transferred to SASO-NMCC team through technical workshops as well as hands-on training. Worth mentioning that SASO-NMCC participates in inert-compressions to build the right capabilities to publish its CMCs.

Research

Training program was completed at TUBITAK UME covering seven main practices. The program consists of theoretical, practical and uncertainty calculation training. Program main practices are briefly discussed below.

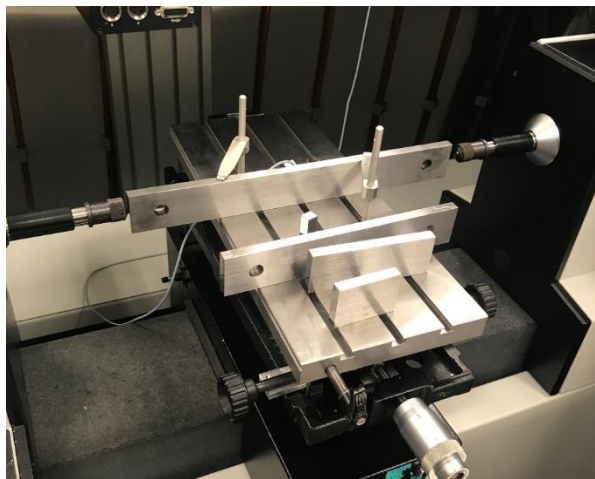
1. 3-D measurements using coordinate measuring machine "CMM";

This part of the training was on how to adjust the coordinate system for example : Spatial rotation, planar rotation, X Origin, Y Origin, Z Origin , Clearance Plane, Measurement Strategy and programming. Additionally, how to measure different types of standards such as KN 100 Contour Master, orifice plate according to ISO 5167-2:2003 , granite parallel, Angle gauge blocks and Master squareness gauge using error separation method.



(Fig.1)KN 100 Contour Master

2. Calibration of 1-D instruments; using laser interferometer and reference gauge blocks set



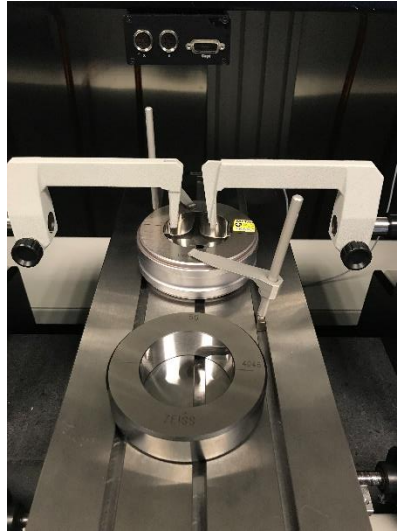
(Fig.2) Laser interferometer set up for calibration of 1-D Instruments.

3. Calibration of form measuring machine; using Roundness standard, Magnification standard (Flick st.), Cylindrical square and Optical flat.



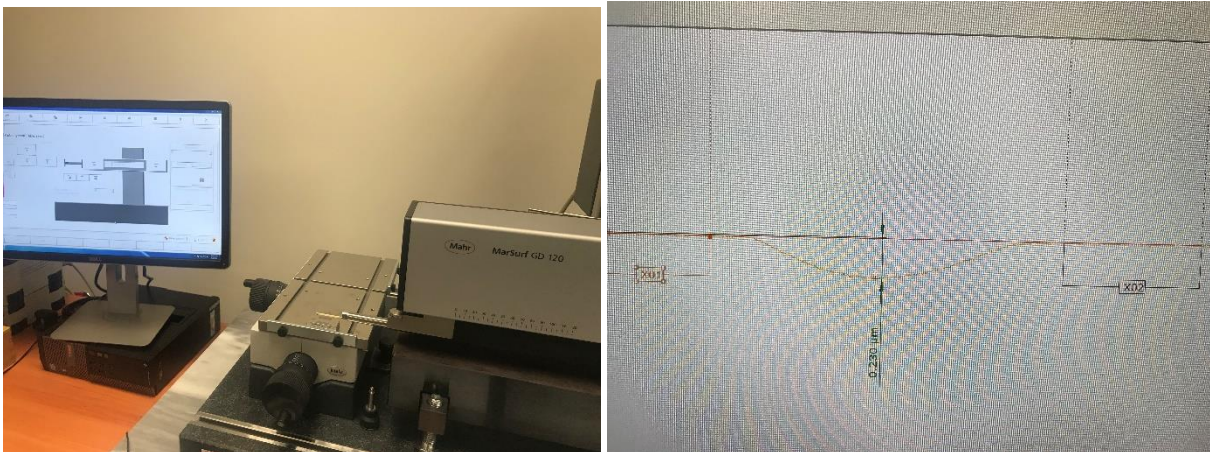
(Fig.3) Calibration of form measuring machine

4. Calibration of diameter standards; The length measuring machine with spherical probe is set using a 80 mm reference ring gauge. The measurement was performed using two different forces to correct the force at the measuring force of zero. Test ring gauge were clamped as in below figure.



(Fig.4) Calibration of ring gauge.

5. Calibration of roughness measurement machine; using Depth setting standard and different three roughness standards.



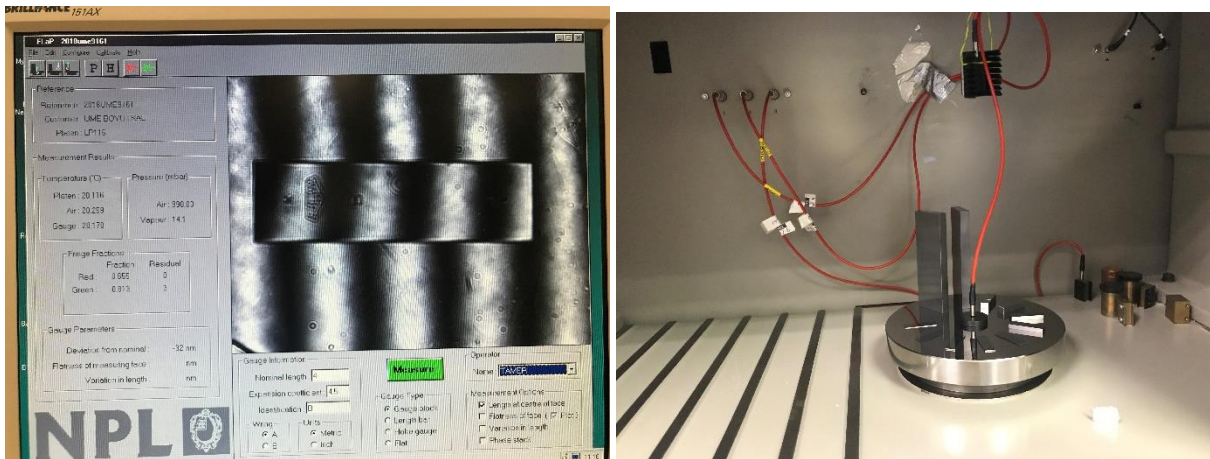
(Fig.5) Calibration of roughness measurement machine.

6. Onsite calibration services; an opportunity was giving to join onsite calibration services at private company for calibration of short gauge blocks comparator and length measuring machine.



(Fig.6)onsite calibration for short gauge blocks comparator and length measuring machine.

7. Calibration of gauge blocks by Interferometry; Include wringing of gauge blocks technique and perform measurement.



(Fig.7) Calibration of gauge blocks by interferometer.

Conclusions and Future Work

Proposed project aims to transfer the knowledge and skills gained in mentioned above program to SASO-NMCC team. In house knowledge transfer program is being developed to share best practice. Additionally, technical workshops will be conducted as well as on hands training.

Acknowledgements

I would like to take this opportunity to express my thanks and appreciation to TUBITAK-UME and BIPM teams for their limitless support and for giving the opportunity to participate in such a beneficial program. Special thanks to my mentor Mr. ilker MERAL and to Okhan GANIOGLU , Bulant OZGUR , Dr. Murat AKSULU , Dr. Muharrem ASAR and Ahmet Omer ALTAN and his team.