SOMMACT Self Optimising Measuring MAChine Tools

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SOMMACT

COOPERATION

Partners:

ALESAMONTI S.r.l. (IT) - Project Coordinator
API VARESE (IT)
FIDIA S.p.A. (IT)
HAVLAT GmbH (DE)
IBS PE BV (NL)
INRIM (IT)
ISM-3D SL (SP)
KOVOSVIT MAS AS (CZ)
SUPSI (CH)
TTS S.r.l. (IT)
University of Huddersfield (UoH) (UK)
WEISS GmbH (DE)

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Study on possible reference structures

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Author:	**Eugen TRAPET**
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1) **R** = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

2) **PU** = Public, **PP** = Restricted to other programme participants, **RE** = Restricted to a group specified by the consortium, **CO** = Confidential, only for members of the consortium

Executive summary

A study has been performed, reviewing the known reference structures for
- full geometry error assessment,
- re-assessment to tune low order terms of these errors, and for finding
- the possibility to be integrated into the machines.

A short validation of these methods for the purposes of SOMMACT was made.

While for the full error assessment many suited methods exist, the re-tuning approaches still require optimization of the reference structures, the measurement processes and the error "injection" into the CNC correction file structure.

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Re-tuning shall allow for process intermittent on the machine measurement.

Most existing reference structures are made for coordinate measuring machines; thus adaptation is still required for machine tools (robustness of the structures and fixturing).

For the reference objects serving for re-tuning, suggestions are made (flexible tetrahedron, ball bar, flexible 3-ball plate and 4-ball plate with calibrated height adaptor.

The machine integration requires completely different structures.

Such structures are suggested here in a generic form, even though they vary from machine to machine. Electronic levels are one suggestion, the 6 dof extensometer beam another, and the 1D extensometer yet another.

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