

# New opportunities in Revised SI: Traceable measurement quantities and improved uncertainties in small mass/force metrology

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## Summary:

The contribution discusses the new opportunities made possible by revised SI. On particular example of small force measurement (below 10  $\mu\text{N}$ ) the new traceability routes for the measurement quantities will be described. Additionally, the improvements deriving from the adopted new methodology will be shown. As a new concept adapted in small mass/force metrology the Photon Momentum method is employed. Thus, the traceability of the force measurements can be obtained in two complementary means. One, that is traceable via optical power detectors to quantum electrical standards, and the second one similarly, is traceable via Kibble balance principle using mass realization methodology to the quantum electrical standards. The Photon momentum method is especially advantageous to use for the small force calibrations below  $\mu\text{N}$  range where the dead weight force calibration method has already several limitations. E.g. during the calibration of small mass standards (to be used further for Force calibration) using conventional subdivision method the uncertainty of these masses grows, reaching a couple of percent level for masses below 0.1 mg.

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