

The DINAMO project reports that, after the first year, an international consortium of national metrology institutes, research centers, and private companies has laid the foundations of an end-to-end digital information flow for dimensional nanometrology, with SPM as the lead use case. Four complementary classes of smart calibration artefacts have been defined and initiated: lattice-traceable silicon step standards, self-organized “fingerprint” lateral standards, multiscale digital patterns, and programmable virtual height/lateral references, alongside scoped benchmark datasets. In parallel, a library of automated SPM data-processing routines for robust evaluation and quality assurance is being assembled, with planned integration into open-source and commercial control software and a FAIR-compliant reference web platform. A provenance-rich SPM data container and semantic model are in development, extending ISO-aligned formats to advanced regimes (high- speed, force-volume, spectroscopic, adaptive scanning) to enable interoperable, reproducible workflows. Uncertainty contributors across artefacts and processing stages have been mapped to support a digital traceability chain and transferability to other instruments (stylus/optical profilometers, focus-variation systems). Forthcoming milestones include initial public releases of algorithms and datasets, drafts of good-practice guides, and early demonstrations of end-to-end uncertainty propagation. By coupling smart artefacts with automated, provenance-aware processing, the DINAMO project advances a reusable blueprint for trustworthy, scalable nanometrology in research and manufacturing.