

SPM'S LITHOGRAPHIC TOOLS: A WIDE FIELD FOR CUSTOM-MADE EXPERIMENTS

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The development of the SPM's as lithographic tools has a wider range of applications besides to the mere surface modification and surface manipulation, being these two already a very general field with many different examples. The wide variety comes along with the versatility of the SPM's, with STM and SFM both capable of working at UHV conditions, ambient air or liquids. Examples of nowadays standard controlled modifications range from atomic scale manipulation with SFM and STM in UHV, surface oxidation with SFM in ambient air or nanografting of thiols with SFM in liquid conditions.

The instrumentation needed to perform a controlled modification of the surface at the nanoscale can also be used to perform custom-made experiments. In this case, not only tip positioning with a certain action is performed in order to modify the surface. Measurements of any magnitude of the experimental system can be programmed and executed in real time at different and precise points of the process allowing flexibility to the SPM experiments.

In order to achieve this in an easy to use and effective way we have developed a script-based software with a graphic environment capable to generate the script code corresponding to the positions where the tip needs to be moved to. Actions to be performed at these positions, as for example ramps of voltage used for spectroscopic curves, can be introduced independently in the code. Parameters such as the movement velocity, loading force at the tip, current between tip and sample, times during which actions take place or set values for some magnitudes to be used as condition for some of the processes are controlled and can be modified at the code. Examples of the versatility of this development will be shown.