

Small Spot UV Source

Application Notes

High resolution photoemission measurements demand not only a highest performance electron spectrometer, but also a UV source with high flux density and small spot size, especially for angular resolved studies.

SPECS has developed a focused UV source on the basis of the proven technology of the UVS 300 source. Using a special capillary, this source can be focused down to a theoretical spot size of 500 micrometers.

In order to estimate key parameters of the focusing geometry, we have performed preliminary measurements on trial geometries. In addition, we developed a simulation program to accurately predict the spot profile and current density on the sample. This program uses true 3d multiple scattering ray-tracing and a Monte-Carlo statistical algorithm.

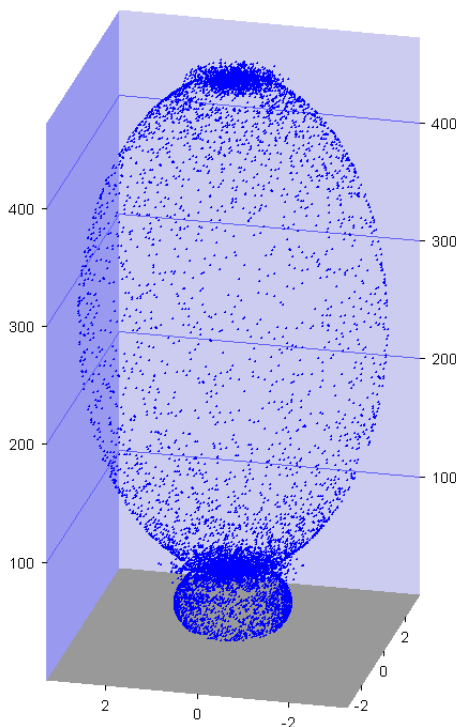


Figure 1: Output of multiple scattering program. UV light rays are ray-traced through the UV source. Each dot represents one reflection event. The simulation includes realistic material properties.

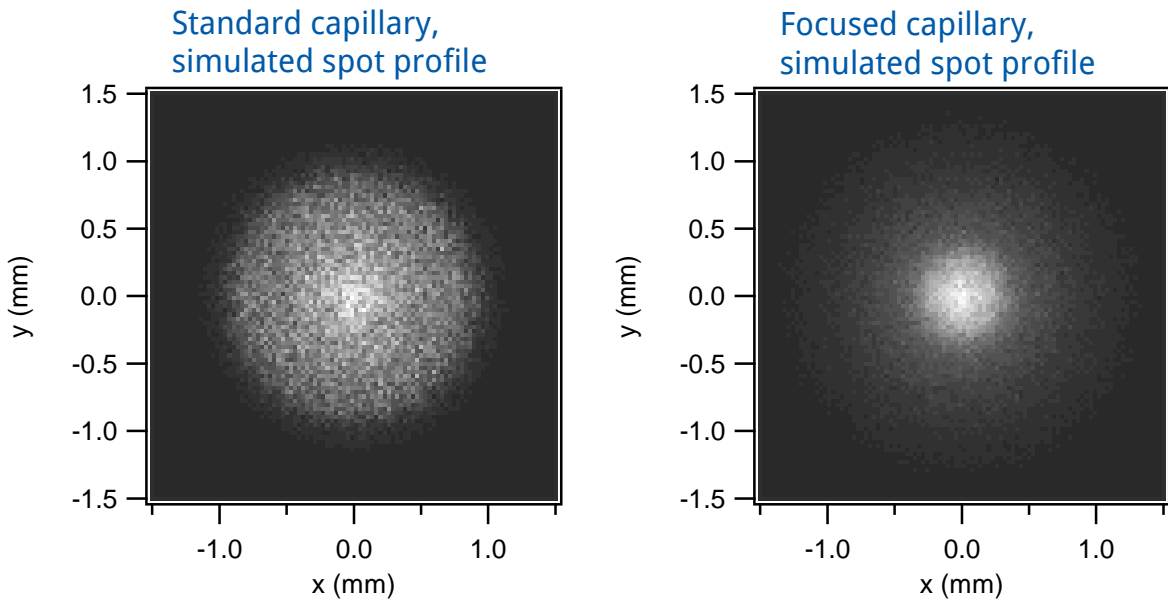


Figure 2: Simulated spot profiles using the Monte-Carlo multiple scattering ray-tracing program. Left: standard quartz capillary. Right: focusing capillary.

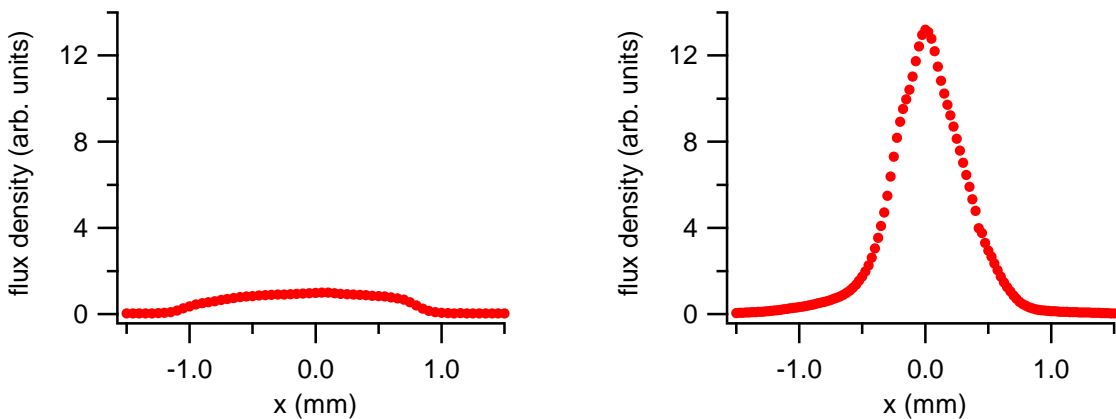


Figure 3: Measured spot profiles, using a Faraday cup with a 115 micrometer entrance aperture. Left: standard quartz capillary. Right: focusing capillary.

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