

# Inprentus Releases White Paper Comparing Diffraction Grating Software Simulations to Real-World Efficiency Measurements

*Inprentus Develops Software to Predict Grating Efficiency of Diffraction Gratings, and Compares Efficiency Simulations to Beamline Efficiency Measurements*

CHAMPAIGN, ILLINOIS, USA, August 26, 2024 /EINPresswire.com/ -- The Inprentus Team has released a White Paper entitled "Simulated versus measured efficiency comparison of a mechanically ruled, variable-line-spacing blazed [diffraction grating](#) manufactured for ALS MERLIN", highlighting a favorable comparison of simulated vs. real-world diffraction grating efficiency measurements.



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Inprentus' proprietary software for simulating efficiency of real-world groove shapes is an important breakthrough in our manufacturing quality assurance, allowing us to better serve our customers”

*Subha Kumar, Inprentus' Chief Operating Officer*

The Inprentus Team has developed proprietary software to predict diffraction efficiency of real, manufactured groove shapes illuminated at designed scattering conditions, order, and energy range. The proprietary software was used to compare simulated efficiency of manufactured grooves to that of the designed perfect triangle and was used to show that efficiency measurements on a grating manufactured for the Advanced Light Source exceed simulated predictions.

The software, developed by Inprentus and verified with GSOLVER and Nevier's Gradif Code, simulates a single

material in transverse electric polarization and extends the simulation capability beyond the Gradif Code to arbitrary surface profiles. For the measurements, we used a Variable Line Spacing (VLS) blazed grating manufactured by Inprentus for the MERLIN beamline at the Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory.

The Inprentus team probed the grating's groove shapes using atomic force microscopy and

applied the software to predict efficiency. Simulated efficiency was then compared to that of the Designed Perfect Triangle and to efficiency measurements performed on the grating by Erik Gullikson, staff scientist at the ALS for beamline 6.3.2. In situ grating efficiency measurements showed that efficiency exceeded Inprentus' simulations.

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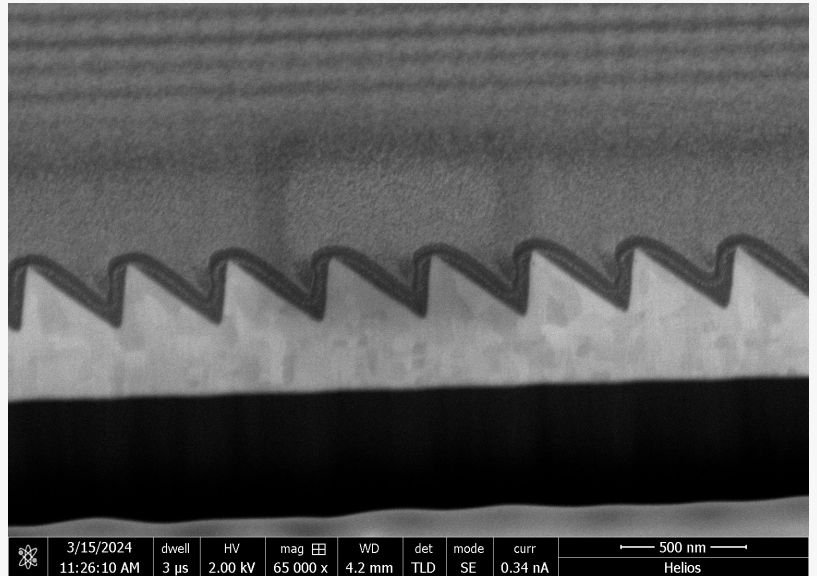
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Inprentus blazed diffraction grating



Inprentus Blazed Diffraction Grating Grooves

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