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Room 280 MRL

ionLiNE a New Tool Concept for Nanofabrication

Jason E. Sanabia, Sven Bauerdick, and Lars Bruchhaus
Raith USA, Inc., 2805 Veterans Highway, Suite 23
Ronkoma, NY 11779
http:/www.raithusa.com/

The Raith *ionLiNE* is an advanced focused ion-beam nanofabrication instrument designed and characterized to meet lithography tool standards. The unique components are the patented NanoFIB column, the ELPHY pattern generator, the laser interferometer stage, and a complete lithography software package, all integrated into one system to enable advanced ion-beam patterning. The ion-beam source and column produce the beam stability required for automated advanced lithography. With a small beam diameter and nominal beam tails, the focused ion-beam offers high lateral selectivity, enabling fabricated feature sizes of 10 nanometers and below. Exposures are made in a variety of scan modes using a high speed 16-bit pattern generator. The pattern generator technology enables nanosecond ion dose control and 3D grey level patterning. For applications covering areas larger than a single exposure field, the laser interferometer stage provides positioning resolution of 1 nm. With these unique features, the *ionLiNE* delivers critical lithography specifications, such as stitching and overlay accuracies. The lithography software permits the generation or import of complex patterns in the widely accepted GDSII data format, job automation for overnight patterning without user interaction, automated dose control, metrology, and automated focus control *via* height sensing schemes. Fixed Beam Moving Stage (FBMS), a zero stitching error writing mode for the seamless exposure of extended structures, completes the advanced patterning of the *ionLiNE*. Additional options, such as a gas-injection system and nanomanipulators, can be added to allow unique nanofabrication and nanoengineering capabilities