QED Induced EUV Lithography

Thomas Prevenslik

QED Radiations
Kelheimer Strasse 8, Berlin 10777 Germany
nanoqed@gmail.com

Abstract Difficulties in extending Moore's law to 13.5 nm may be traced to LPP lithography. LPP based on classical physics creates EUV light by the ionization of atoms at high temperature. High power CO_2 lasers are used to heat solid and gas targets and produce EUV light by atomic emission. LPP systems are not only complex, but very expensive costing as much as US $120 million. Unlike classical physics, QED induced EUV lithography based on QM offers as far simpler and inexpensive alternative. QED stands for quantum electrodynamics and QM for quantum mechanics. The EUV source comprises a small spherical glass lens provided on the front surface with a nanoscale zinc oxide coating. A heater on the back surface allows EM energy to flow into the coating, but QM precludes any increase in the coating temperature. Instead, QED converts the EM energy into a steady coherent source of EUV light. Lasers are not required. The EUV wavelength is 2nd, where n and d are the refractive index and thickness of the coating. For zinc oxide, the QED radiation induced for thicknesses d < 5 nm is in the EUV having wavelengths < 20 nm. Extensions are made to hand-held EUV sources for irradiating biological specimens.

Oral presentation is requested.

Thomas Prevenslik is a retired American living in Hong Kong and Berlin. He is a graduate of Carnegie Institute of Technology and the University of Pittsburgh. During his career, he worked for Owens-Illinois and Contraves-Goerz as a Mechanical engineer performing ANSYS computer simulations in structural dynamics and heat transfer of space telescopes and gas bearing suspension. He became involved in QM because classical physics failed to provide rational explanations of observations at the nanoscale, and therefore he developed the theory of QED induced radiation. By this theory, the heat capacity of the atom vanishes in nanostructures thereby precluding the conservation of absorbed EM energy by the usual increase in temperature. Instead, QED creates EM radiation that charges the nanostructure, or otherwise, is emitted to the surroundings. See www.nanoqed.org