



TECHNOLOGY

Surface Immersion Microscope

OVERVIEW

The resolution of any far-field optical microscope is limited by diffraction. The order of magnitude of the resolution is $R \sim 1/n$. A common way of increasing the resolution of a conventional microscope is to immerse the sample into a liquid with a refractive index of n . In fact immersion microscopes exploit this physical property. However, the range of refractive indices of known materials in the visible range is limited n is less than 2.4, and the resolution of a usual immersion microscope remains limited by the wavelength of light in a vacuum.

This invention makes use of the extremely large effective refractive index experienced by surface electromagnetic waves in their interaction with thin dielectric objects. The effective refractive index of a dielectric object on such a surface may reach up to $\sim 1,000$. Thus the resolution of this "new" immersion microscope may reach a few nanometers.

Implemented in reverse, such a microscope may be used in subwavelength lithography with nanoscale resolution.

See U.S. published patent application No. 2005-0185186-A1.

For more information please contact otc@umd.edu, 301- 405-3947 .

CONTACT INFO

UM Ventures
0134 Lee Building
7809 Regents Drive
College Park, MD 20742
Email: umdtechtransfer@umd.edu
Phone: (301) 405-3947 | Fax: (301) 314-9502

Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

awaiting action

LICENSE STATUS

Contact OTC for licensing information

CATEGORIES

- Imaging devices

EXTERNAL RESOURCES

- [US Patent 7,362,442](#)
- [US Patent 7,362,440](#)

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