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Nanofabrication Techniques of Subwavelengthsize Aperture for NSOM Application

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Recently there have been tremendous efforts to fabricate the subwavelengthsize aperture for potential nearfield optical probe. The nearfield optical probe or NSOM probe can be utilized for 100Gbyte DVD fabrication and for living cell studies. The advantage of NSOM can overcome diffraction-limited resolution-the shortage of the conventional optical microscope. The resolution of NSOM is dependent upon the size of the aperture and distance between the probe and the sample.

There are several ways to fabricate the NSOM probe. Fabrication techniques can be categorized as (i) laser melting of the optical fiber, (ii) nanosize tip fabrication followed by PR stripping method, sputter-etching, etc-- *so called positive technique,* (iii) fabrication of V-groove followed by dry etching or wet etching,-- *so called negative technique,* and (iv) focused ion beam method. The experimental details of negative technique and positive technique will be reported. In addition, general advantages of the techniques will be discussed.