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Fabrication of NSOM Cantilever using Wet isotropic Etching

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We successfully fabricated the nano-size silicon oxide apertures on the cantilever array as near-field optical probe. The various semiconductor processes were utilized for sub wavelength size aperture fabrication. The anisotropic etching of the Si substrate by alkaline solutions followed by anisotropic crystal orientation dependent oxidation, anisotropic plasma etching, isotropic oxide etching was carried out. The 3 and 4 micron size dot array were initially photolithographically patterned on the Si (100) wafer. After fabrication of the V-groove shape by anisotropic etching, the oxide growth at 1000 C was performed to have an oxide etch-mask. The oxide layer on the Si (111) plane have been utilized as an etch mask for plasma dry etching and water-diluted HF wet etching for nanosize aperture fabrication. The Au thin layer was deposited on the fabricated oxide nano-size aperture on the cantilever array. The initial opening, 300 nm of the oxide aperture was reduced down to ~ 95 nm