

# SUPER-RESOLUTION COVER GLASS SLIP: APPLICATIONS OF THE NEAR-FIELD DETECTION OF LOCALIZED SURFACE PLASMON

Cheng Chi Chen\*, Yu Hsuan Lin, Tsung Sheng Kao, Wei Chi Lin, Din Ping Tsai  
 Department of Physics, National Taiwan University, Taipei 10617, Taiwan  
 Center of Nanostorage Research, National Taiwan University, Taipei 10617, Taiwan  
 \*Graduate Institute of Electro-Optical Engineering, National Taiwan University, Taiwan  
 Tel: +886-2-3366-5100 Fax: +886-2-2363-9928  
 E-mail: dptsai@phys.ntu.edu.tw

**KEY WORDS:** Super-resolution, near-field optical imaging, near-field optical microscopy, surface plasmon, localized surface plasmon, super-resolution cover glass slip

An optical super-resolution technique using a simple, inexpensive and novel cover glass slip, a super-resolution near field cover glass slip (SR-CGS) which is consisted of multi-layered nano structured thin films (e.g. ZnS-SiO<sub>2</sub> [130nm] /AgOx [15nm]/ ZnS-SiO<sub>2</sub> [40nm]) on a glass substrate was put into the practice for an ultrahigh resolution and high scanning speed near-field optical imaging using a traditional scanning laser microscopy.

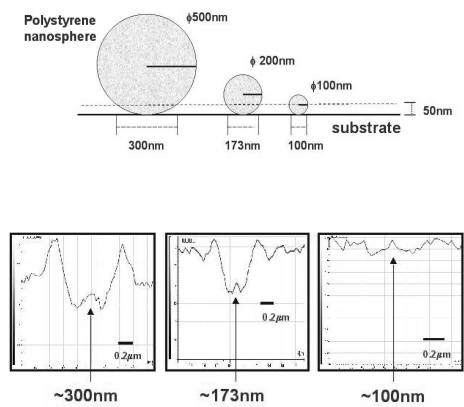


Fig. 1 Reflection imaging profiles of the 500, 200 and 100 nm standard latex spheres, respectively.

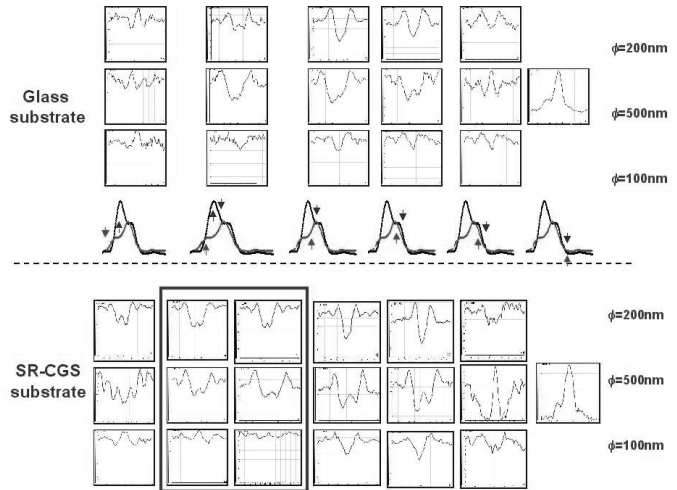


Fig. 2. Imaging profiles on different cover glass slips for various standard latex spheres and focusing depths.

Figure 1 demonstrates the near-field imaging profiles of the standard latex spheres of the sizes of 500, 200 and 100 nm, respectively. Figures 2 show the comparison of the imaging profiles of normal cover glass slip and super-resolution near field cover glass slip (SR-CGS).

References: [1] W.C. Liu, D. P. Tsai, Phys. Review B 65, 155423 (2002) and D. P. Tsai, et al., Phys. Rev. Lett. 72, 4149 (1994).