

Papers Published in Technical Journals and Conferences

10-Gbit/s data transmission with forward error correction using a 120-GHz-band wireless link

A. Hirata, N. Iai, R. Yamaguchi, H. Takahashi, T. Kosugi, K. Murata, N. Kukutsu, Y. Kado, S. Kimura, S. Okabe, H. Ikegawa, H. Nishikawa, T. Nakayama, and T. Inada

Asia Pacific Microwave Conference, IEEE, Vol. 1, No. 1, p. A3-11, Hong Kong, China, 2008.

We introduced FEC used for optical fiber transmission into a 120-GHz-band wireless system that has a data rate of over 10 Gbit/s and evaluated the effect of the error-correction ability in the wireless link. The use of FEC improved the minimum received power for error-free transmission and the stability of a wireless link with transmission distance of 800 m.

Atomic Force Microscopy Observation of Membrane Proteins Suspended over Carbon Nanotube Network

K. Sumitomo, Y. Shinozaki, D. Takagi, H. Nakashima, Y. Kobayashi, and K. Torimitsu

Jpn. J. Appl. Phys., Vol. 48, No. 8, p. 08JB18, 2009.

Atomic force microscopy (AFM) imaging of membrane proteins suspended over a nanostructure in liquid is a promising way to understand the structure and function of working proteins, although the membrane deformation that occurs during scanning makes it difficult

to obtain a high-resolution image. This study investigated an artificial cell system for the AFM observation of functional membrane proteins that consists of a submicrometer well on Si, a biological membrane, and a carbon nanotube (CNT) network. We successfully observed molecular-scale images of a purple membrane suspended over submicrometer well patterns. By using a CNT network to hold the suspended membrane, we suppressed the membrane deformation caused by the “imaging force”. The CNT network takes the place of a cytoskeleton in supporting the cell membrane suspended over the well, thus improving the spatial resolution of AFM measurement.

Ultrasmall Reader/Writer with Multiple Contactless Interfaces on a Flexible Circuit Board

H. Yamamoto, M. Ikeda, and Y. Hosoda

Trans. IEICE, Jpn., Vol. E92-B, No. 9, pp. 2992–2995, 2009.

In order to incorporate the reader/writers (RWs) into mobile electronic devices, miniaturization and flexibility are required. To meet these requirements, we fabricated an ultrasmall RW with multiple contactless interfaces by mounting main unit circuits inside the antenna coil and using a flexible multilayer circuit board.
