

Design of Nano-Photonic Phased-Array Antennas for Wide-Angle Beam-Steering

Jong-Hun Kim*, Jong-Bum You*, Ji-Hwan Park*, Kyoungsik Yu* and Hyo-Hoon Park*

**School of Electrical Engineering, Korea Advanced Institute of Science and Technology (KAIST),
Yuseong, Daejeon 34141, Korea*

**jhkim09@kaist.ac.kr, youjongbum@kaist.ac.kr, pjh1400@kaist.ac.kr, ksyu@kaist.ac.kr,
parkhh@kaist.ac.kr**

Abstract— We propose nano-photonic phased array antennas suitable for wide-angle beam-steering. Two type of antenna based on the grating structure and the plasmonic metal thin film are designed using a finite-difference time-domain simulator. With the grating structure formed in the silicon waveguide the phased array antenna provides.

Keyword— Phased-array antenna, optical radiator, grating radiator, metallic nano-antenna, photonic antenna



Jong Hun Kim received M.S. degree in department of Electrical Engineering from KAIST (Korea Advanced Institute of Science and Technology), Korea, in 2011. He is now a Ph.D. course in department of Electrical Engineering from KAIST. His current research interests include silicon photonics, and optical interconnection.



Jong Bum You received M.S. degree in Advanced Device Technology from University of Science and Technology in 2010. He is now a Ph.D. course in department of Electrical Engineering from KAIST (Korea Advanced Institute of Science and Technology). His current research interests include silicon photonics, and Nano-photonics.



Ji Hwan Park received B.S. degree in Electrical Engineering from Korea University, Korea, in 2014. He is now a Master course in department of Electrical Engineering from KAIST (Korea Advanced Institute of Science and Technology). His current research interests include silicon photonics, and optical interconnection.



Kyoungsik Yu received B.S. degree in Electrical Engineering from Seoul National University, Korea in 1999, his M.S. and Ph.D. degree in Electrical Engineering from Stanford University, USA, in 2001 and 2004, respectively. From 2007 to 2010, he was a postdoctoral researcher from University of California, Berkeley, Electrical Engineering and Computer Sciences, Berkeley Sensor and Actuator Center, USA. Since 2010, he is an associate professor of Electrical Engineering, KAIST (Korea Advanced Institute of Science and Technology), Korea. His current research interests include nanophotonics, optical MEMS and so on..



Hyo Hoon Park received M.S. and Ph.D. degree in department of Materials Science and Engineering from KAIST, Korea, in 1982 and 1985, respectively. From 1985 to 1986, he was a post-doctoral scholar from Stanford University, USA. He was working for ETRI (Electronics Telecommunications Research Institute) since 1997. Since 2009, he is a professor of Electrical Engineering, KAIST (Korea Advanced Institute of Science and Technology), Korea. His current research interests include silicon nanophotonics for microprocessor-memory interfaces, multi-chip and 3D chip nanophotonic interconnection and so on.