

Analysis of Digital Retrodirective Array System Considering Multipath Signal

Junyeong Bok*, Seung Hwan Lee**, Dong Jin Shin**, Heung-Gyoon Ryu*

**Department of Electronic Engineering, Chungbuk National University, Korea*

***ETRI(Electronics and Telecommunications Research Institute), Korea*

bjy84@nate.com, lsh@etri.re.kr, djsin@etri.re.kr, ecomm@cbu.ac.kr

Abstract— Retrodirective array antenna is possible to do automatically beam-tracking because it can control the phase information of the output signal toward opposite direction to input signal without a priori knowledge of the arrival direction. The receive performance of retrodirective array system is degraded considering multipath signal in wireless communication system. In this paper, we analyze the system performance of digital retrodirective array system using digital phase conjugation under multipath signal. Simulation results show that the error about phase and magnitude of direct signal direction occur in the present of multipath signal.

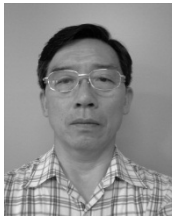
Keyword— Retrodirective antenna, multipath signal, phase detection, phase conjugation.



Junyeong Bok was born in Chungnam, Republic of Korea in 1985. He received the B.S. and M.S degrees in the department of electronic engineering from Chungbuk National University in 2010 and 2012. Now he is currently working toward Ph.D. degree at the department of Electronic Engineering, Chungbuk National University, Republic of Korea. His research interests include digital communication system, OFDM communication system and digital retrodirective array antenna system.



Seung Hwan Lee received the BS and MS degrees from Korea University, Seoul, Korea, in 1995 and 1997, respectively, and the PhD degree from the University of Edinburgh, Edinburgh, UK in 2007. He has been with the Electronics and Telecommunications Research Institute since 2001. He has also been an adjunct professor of University of Science and Technology in the field of wireless communications since 2010. He is currently in charge of developing wireless interference-aware techniques for 5G systems as a team leader. His research includes distributed small cell networks, compact MIMO, Cognitive Radio Systems, and multipoint-to-multipoint communications.



Dong Jin Shin received the BS degree from Chungnam National University, Korea, in 1978, and the MS and PhD degrees from Seoul National University, Korea, in 1980 and 1990, respectively. He has been working for the Electronics and Telecommunications Research Institute since 1982. He had been a project leader and division manager from 1988 to 2002 for developing the time division switching systems (TDX) and the CDMA wireless communication systems. He is currently a principal researcher and interested in researching the visions for the 5th Generation wireless communications and the QoE enhancing technologies for the small cell networks.



Heung-Gyoon Ryu (M'88) was born in Seoul, Republic of Korea in 1959. He received the B.S. and M.S. and Ph.D. degrees in electronic engineering from Seoul National University in 1982, 1984 and 1989. Since 1988, he has been with Chungbuk National University, Korea, where he is currently Professor of Department of Electrical, Electronic and Computer Engineering in Chungbuk National University. And he worked as Chief of RICIC (research institute of computer, information communication center) in Chungbuk National University from March 2002 to Feb 2004. His main research interests are digital communication systems, communication circuit design, spread spectrum system and communication signal processing. Since 1999, he has worked as reviewer of the IEEE transaction paper. He was a winner of '2002 ACADEMY AWARD' from the Korea Electromagnetic Engineering Society, Korea. He received the "BEST PAPER AWARD" at the 4th International Conference on Wireless Mobile Communications (ICWMC 2008) Athens, Greece, July 27-Aug.1, 2008. Also, He received the "BEST PAPER AWARD" at the International Conference on Advances in Satellite and Space Communications (SPACOMM 2009), Colmar France, July 20-25, 2009.