

# Stochastic Ordering Based Carrier-to-Interference Ratio Analysis for the Shotgun Cellular Systems

Prasanna Madhusudhanan, Juan G. Restrepo, Youjian (Eugene) Liu, Timothy X. Brown, and Kenneth R. Baker

*Abstract* A stochastic ordering based analysis is presented for the carrier-to-interference ratio (CIR) in shotgun cellular systems. The CIR is shown to be a function of the number of active users in the system. The analysis is based on the stochastic ordering of the CIR and the resulting distribution of the CIR is derived. The analysis is applied to the case of a single cell and a multi-cell system. The results show that the CIR is a function of the number of active users in the system and the distribution of the CIR is derived. The analysis is applied to the case of a single cell and a multi-cell system. The results show that the CIR is a function of the number of active users in the system and the distribution of the CIR is derived.

52 .7 / -33.6 / 2.2 6-1.4 3 1 2.37 2.37 4.6 471.225 1 1 .626  
-1.125 D.5 .5-354.4 6 6 / -33.2 6 6 .7 -1.164 D.25 43.1 -43.2 6.1 -427.6 -435.4 56. -41/ 1. -432. -1. 6.1

and i.i.d. transmission powers can be captured by modifying the BS density as shown in Section IV-D, they are assumed to be 1 for all BSs. The generalization to arbitrary path loss model is given in [2, Section VI], which is also equivalent to modifying the BS density  $\lambda(\cdot)$ . As a result, <sup>c</sup>



