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$fig/block_diagram3.eps An illustration of the NOMA-aided UCS operating in a suburban environment. The GS employs dou$
N_D
??
N_D
?
?
h_{min}
?
?
O
r_a
$[0, 2\pi)$
j
$d_j =$
$\sqrt{D_j^2 + h_j^2}$
$1 \leq$
$j \leq$
N_D
j
D_j
j
$h_j =$
$h_{min} +$
$\omega \frac{j}{N_D}$
j
$\omega >$
0
j
$f_{d_j}(w)$
d_j
?
?

$$f_{d_j}(w) = \frac{2w}{r_a^2}, \quad (1)$$

$L_{m,j} \leq$
$w \leq$
$L_{p,j}$
$L_{m,j} =$
h_j
$L_{p,j} =$
$\sqrt{h_j^2 + r_a^2}$
$f_{d_j}(w)$
j
j
$R_{j,l}$
l
j
$l \in$
$\{1, 2\}$
$R_{j,l}$
l
j
$(SINR_{j,l})$

$$SINR_{j,l} = \frac{P_r a_j d_j^{-L} |R_{j,l}|^2}{1 + P_r d_j^{-L} |R_{j,l}|^2 \sum_{i=1}^{j-1} a_i} \quad (2)$$