

Elektrotechnik-Elektronik-Informationstechnik

EEI KOLLOQUIUM

Accurate Analytical Performance Description of Amplify-and-Forward Relaying

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A statistical model can be derived for the equivalent signal-to-noise ratio of the Source-Relay-Destination (S-R-D) link for Amplify-and-Forward relaying systems that are subject to block Rayleigh-fading. The probability density function and the cumulated density function of the S-R-D link-SNR involve modified Bessel functions of the second kind. A novel approach is introduced to rewrite those Bessel functions in a suitable series form using simple elementary functions. Based on this, a statistical characterization of the total receive-SNR at the destination can be provided, even for a more general relaying scenario, in which the destination receives signals from both the relay and the source and processes them using maximum ratio combining. With this novel statistical model, simple analytical and accurate expressions for the outage probability, the bit error probability and the ergodic capacity can be found.