

# Jordan University of Science and Technology

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**Abstract:** In this paper, we consider a dual hop wireless communication system with a non-regenerative relay and study its performance over the  $\alpha/\mu$  fading channel. Specifically, we derive closed-form expressions for the moment generating function (MGF), the cumulative distribution function (CDF), and the probability density function (PDF) of the harmonic mean of the end-to-end signal-to-noise ratio (SNR) assuming the alpha-mu fading model. We also derive closed-form expressions for the end-to-end capacity and outage capacity of the system herein. The obtained expressions can be reduced to study the performance of dual hop communication systems over other fading channel models by using the proper values for the alpha and mu parameters, such as Rayleigh, Nakagami-m, and Weibull fading models. Numerical results are provided for the obtained expressions and conclusion remarks are drawn.