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# Capacity Limits of Spectrum-Sharing in Hoyt (Nakagami-q) Fading Channels

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## Abstract:

A channel capacity analysis is presented in this work for a spectrum-sharing cognitive radio link in which the fading experienced by the signal is modeled with the Hoyt (Nakagami-q) distribution. Based on a novel formulation of the squared Hoyt distribution derived by the authors, simple expressions for the capacity of the secondary link in a number of scenarios of interest are derived, which are given in terms of easy-to-compute finite-range integrals of elementary functions. The effect of fading severity in the secondary transmitter-primary receiver (ST-PR) and secondary transmitter-secondary receiver (ST-SR) links, and the impact of different antenna gains on the system performance are analyzed. We show that in the presence of severe fading for the ST-PR link, the capacity of the ST-SR link is increased.

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