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## Physical-Layer Security in Underlay Cognitive Radio System with Full-Duplex Secondary User over Nakagami-m Fading Channel

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**Abstract:** In this paper, we study an underlay Cognitive Radio (CR) system with energy harvesting over Nakagami-m fading channel. This system consists of a secondary source, a secondary receiver, a primary receiver and a single eavesdropper. The source in the secondary network has one antenna and transmits information to the secondary receiver equipped with two separated antennas to operate in a Full-Duplex (FD) mode. The upper and lower bounds for the Strictly Positive Secrecy Capacity (SPSC) are derived and the numerical results demonstrate that the performance of the proposed system can be improved by increasing the average channel power gain between the source and the destination. Here, the lower and upper bounds are merged to form the exact SPSC when the total interference is below a predefined limit.