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## **A Study of the Energy Detection Threshold in the IEEE802.15.6 CSMA/CA**

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Abstract—A Body Area Network (BAN) is a radio interface standard for wireless connectivity of wearable and implantable sensors located inside or in close proximity to the human body. Medical applications requirements impose stringent constraints on the reliability, and quality of service performance in these networks. Interference from other co-located BANs or nearby devices that share the same spectrum could greatly impact the data link reliability in these networks. Specifically, the CSMA/CA MAC protocol as outlined in the IEEE802.15.6 BAN standard involves the use of an energy detection threshold to determine the status of the transmission channel i.e. idle versus busy. In this paper, we would like to show that the use of such static thresholds could negatively impact the performance of the system composed of multiple co-located BANs. It could also lead to starvation or unfair treatment of a node that is experiencing excessive interference due to its physical location relative to all other nodes in the system. A simulation platform is presented to highlight this problem and investigate the performance impact.

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