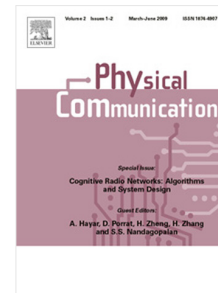


## Accepted Manuscript

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PII: S1874-4907(18)30051-X

DOI: <https://doi.org/10.1016/j.phycom.2018.03.013>

Reference: PHYCOM 515

To appear in: *Physical Communication*

Received date: 23 January 2018

Revised date: 11 March 2018

Accepted date: 24 March 2018

Please cite this article as: D. Deng, M. Yu, J. Xia, Z. Na, J. Zhao, Q. Yang, Wireless powered cooperative communications with direct links over correlated channels, *Physical Communication* (2018), <https://doi.org/10.1016/j.phycom.2018.03.013>

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## Wireless Powered Cooperative Communications with Direct Links over Correlated Channels

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### Abstract

In this paper, we investigate the impact of correlated channels on the wireless powered cooperative networks, where the direct links between the source and destination exist and are correlated with the relaying links. In the considered system, the time switching-based relaying protocol of simultaneous wireless information and power transfer is used. In order to enhance the system performance, a better branch between the relaying link and the direct link is selected. We evaluate the system transmission performance by deriving the closed-form expression on outage probability as well as the asymptotic results for the proposed scheme, in the high regime of transmit power. Based on the theoretical analysis, we investigate the effects of the system parameters, such as channel correlation coefficient, average channel fading power, energy harvesting coefficient and slot allocation coefficient, on the system outage probability. Numerical results are provided to verify the theoretical analysis.

*Keywords:* energy harvesting, cooperative system, correlated channels, selection combination, outage probability

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