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(54) Title of the invention : RELAYING PROTOCOL FOR SCATTERED SENSOR NETWORKS WITH ENERGY HARVESTING RELAY NODES

<p>(51) International classification :H02J0007350000, F16H0037080000, H04W0084180000, H04B0007155000, H04L0005160000</p> <p>(86) International Application No :NA Filing Date :NA</p> <p>(87) International Publication No :NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p>	<p>(71)Name of Applicant : 1)Dr. Shilpi Pal Address of Applicant :Associate Professor, Electronics & Communication Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 2)Dr. Neelu Trivedi 3)Dr. Puneet Khanna 4)Mr. Sanjeev Kumar Singh 5)Mr. Ankit Aggarwal 6)Dr. Madhvi Gupta 7)Dr. Hitesh Joshi 8)Mr. Hitendra Kumar Singh 9)Mr. Shalabh Gaur 10)Ms. Chhavi Gupta Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : 1)Dr. Shilpi Pal Address of Applicant :Associate Professor, Electronics & Communication Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 2)Dr. Neelu Trivedi Address of Applicant :Professor, Electronics & Communication Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 3)Dr. Puneet Khanna Address of Applicant :Professor, Electronics & Communication Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 4)Mr. Sanjeev Kumar Singh Address of Applicant :Assistant Professor, Electronics & Communication Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 5)Mr. Ankit Aggarwal Address of Applicant :Assistant Professor, Electrical Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 6)Dr. Madhvi Gupta Address of Applicant :Assistant Professor, Electrical Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 7)Dr. Hitesh Joshi Address of Applicant :Assistant Professor, Electrical Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 8)Mr. Hitendra Kumar Singh Address of Applicant :Assistant Professor, Electrical Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 9)Mr. Shalabh Gaur Address of Applicant :Assistant Professor, Electrical Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 ----- 10)Ms. Chhavi Gupta Address of Applicant :Assistant Professor, Electrical Engineering, IFTM University, Moradabad, Uttar Pradesh, Pin Code: 244102 -----</p>
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(57) Abstract :

The Present invention relates to a novel relaying protocol for wireless sensor networks with energy harvesting relay nodes. The protocol combines Adaptive Time-Switching (ATS) and Adaptive Time-Switching-Adaptive Power-Splitting (ATS-APS) schemes to optimize energy harvesting and communication. Relays operate in half-duplex mode, alternating between energy harvesting and signal processing based on energy availability. The source-to-relay transmission is dynamically divided into sub-slots for energy harvesting and decoding, while the relay transmits to the destination after sufficient energy is harvested and decoding is successful. The protocol adapts time and power allocation, maximizing transmission efficiency and ensuring reliable communication under power constraints and Rayleigh fading conditions. Additionally, the protocol supports diversity combining techniques, such as Selection Relaying (SR), to further enhance performance. This design provides an energy-efficient, high-performance solution for scattered sensor networks.

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