# Abstract

Wireless Sensor Network (WSN) is being used widely for environment monitoring. Resource constrained low cost sensor nodes deployed in large number are the potential source of information in WSN. The sensor nodes are capable of coordinating among themselves to form the network and send their sensed/collected information to a remote base station (BS) accessible to us directly or indirectly through internet. Often sensor nodes are associated with limited non-rechargeable battery and therefore judicious use of the battery power is essential for longer life of the network. Researchers have been proposing multi-hop data gathering protocols for longer life of the network. These protocols are elegant in terms of consumption of battery power, but suffer from a basic limitation. In the initial rounds of communication, all the nodes participate in data gathering process and therefore data received at the BS is from the entire network field. However, as the time progresses, nodes starts dying due to run out of battery power and coverage hole area increases.

In our dissertation, we have proposed a moving sink based architecture that not only gives longer life to the WSN, but also takes care of issue of coverage hole for entire life of the network. The sensors are distributed in circular area which is divided into hexagonal cells. The radius of the cells is equal to the transmission range of the sensor nodes. The sink moves to each cell in a spiral track, collects the sensed information from the sensors and sends to the base station. Simulation is carried out in Matlab and the results show that all most all the sensor nodes remain active throughout the entire life of the network.

*Keywords*:Wireless sensor networks, Data gathering, Energy efficiency, Moving sink, Coverage hole, Spiral track