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A LIGHT WIND SPEED MEASUREMENT SYSTEM DESIGN TO STRENGTHEN WIRELESS SENSOR NETWORK FUNCTIONS

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Abstract. *Wireless Sensor Network (WSN) applies a breeze function for remote light wind speed measurement system. This research designed a portable anemometer that can display two-dimensional direction and data as well as measure small instantaneous variations in small wind speed using a wireless sensors network. The research principle is to use Negative high-voltage free air molecules to form different equipotential fields, which will offset as they are affected by wind. The voltage differences are measured using sensing bars of four terminals indicating wind speed and wind direction. The sensors can sense air convention, gas emissions and gas leakage in wide range of applications such as aerospace, energy and food, biochemical laboratory, hospital isolation room, office, storage facilities, mine field, tunnel and vehicles. In the future, integrated electric circuits can be designed into the IC for application in MEMS to make measurements without external high voltage. This can allow measurements for micro-surgery and measure the airflow in and around body organs.*

Keywords: Electric field, Breeze sensing network, Wind speed, Measurement, Wireless sensors network

1. **Introduction.** The common anemometer is a one-dimensional structure that determines the wind direction shall before measuring the wind speed. This device is not accurate in measuring small wind speeds. The vane anemometer can only measure wind speed in a single direction. Its' vane will not move when the wind speed is too small. A hot wire anemometer can only measure wind speed in a single direction and a small wind speed cannot achieve lower the temperature. The aim of this research is to design an anemometer that can measure wind speed in two directions under small wind speed.

Negative high-voltage free air gas molecules are used to form different equipotential fields to offset the wind speed. The voltage differences are measured using four terminal sensing bars to indicate the wind speed and wind direction values. The obtained wind speed measurements from a small wind are compared with those from a vane anemometer. The advantage of the two-dimensional electric field anemometer is its two-dimensional structure, allowing it to measure wind direction and speed at the same time. The measured value can be less than 0.1m/s with quick response and no movement inertia. The proposed device can measure variations in instantaneous wind speed and not be easily affected by the environment. To enhance set-up ratio, excellent efficiency, thinness and small size, a piezoelectric transformer is used to generate the negative high voltage. The circuit design uses a piezoelectric transformer to generate negative high voltage with high