**RFID 1: Broadband Textile-Based Passive UHF RFID Tag Antenna for Elastic Material** by Shuai Shao, Asimina Kiourti, Robert J. Burkholder and John L. Volakis

RFID uses radio frequency waves to interact with the RFID tag. The RFID tag gets activated only when the RFID scanner is nearby around 10 to 20cm. The commercially available RFID tag are not very flexible and this effects the durability. This paper talks about how more flexible textile based RFID tag can be implemented. The commercially available RFID tag antennas work in UHF(Ultra High Frequency) spectrum range of 952–954 MHz for its use. High-powered passive tag systems can use an antenna power between 10 mW to 1 W and an antenna gain of 6 dBi.

The more flexible version of the RFID tag antenna is built for implementing with elastic material for example automotive tires. The designed tag uses low profile structure so that the complexity of fabrication and the manufacturing cost is reduced. The elasticity provided by this type of flexible tag can help in operating in hostile environments where they may be subjected to deformation. The tag designed has better read ranges than the ones implemented using copper wires, this is due to the fact the new tag is fabricated by embedding the RFID tag in a polymer.

By using a flexible and textile based RFID tag antenna it was demonstrated that the antenna achieves a bandwidth of 263MHz in free space and it also maintains its tuned behavior when the tag is placed in dielectric medium. The performance of the designed tag was also observed and it was concluded that the tag does not degrade under mechanical deformation up to 10%, which good evidence that the tag can handle hostile environments.

**RFID 2: UHF RFID Localization Based on Phase Evaluation of Passive Tag Arrays** by Martin Scherhäufl, Markus Pichler and Andreas Stelzer

RFID tags are used in widely for tracking objects and shipments. The real time location of the object using the RFID tag is difficult to obtain as the tag needs to be in active mode always. The location information using a passive tags in implemented in this paper. Many papers have been written which uses the k-nearest neighbor principle localization systems for passive RFID tags. These systems used the RSSI (Received Signal Strength Indicator) at the reader and compare it with different RSSI of the reference tags.

The RFID localization system used here rely on phase evaluation of the tag response signal. This evaluation is represented using the term phase of evaluation (PoA). A multiple input multiple output system is designed which consists of each frontend is configured to work as transmitter and the remaining frontend is configured to work as receiver. The measurements were carried out in an indoor office. A 2D representation of the position measurement was demonstrated for the passive RFID tags based on PoA evaluation of the signals. The ambiguity in the phase measurement is handled by arranging tags in an uniform linear array to simultaneously estimate its position.

**RFID 3: UHF RFID Localization Based on Evaluation of Backscattered Tag Signals Arrays** by Martin Scherhäufl, Markus Pichler and Andreas Stelzer

In this paper the localization of the RFID is based on evaluation of backscattered tag signals. By combining phase and amplitude evaluation the accuracy and the robustness of the estimation of tag position if improved compared to the approach of using either one of them. The passive RFID transponder which is used to estimate the position of the tag communicates its information by means of backscatter modulation, where the reflection coefficient of the tag antenna is switched between two stages in accordance with the data being sent. Hence the localization can achieved based on PoA and amplitude as these parameters rely on the position of the RFID transponder. Furthermore the algorithm used here does not rely on reference transponders.