**General Description**

Printed antennas representing printed conductive patterns play an important role in the areas of applications of radio frequency identification (RFID) technology. These areas cover the field of logistics in industrial and retailer environments and wireless communication applications. One major competence of the Fraunhofer ENAS is design, simulation, printing/manufacturing and characterization of the adapted and customized RF antennas. The antennas can be manufactured by employing traditional printing (screen, gravure) as well as digital manufacturing equipment based on inkjet technology. These digital fabrication systems facilitate highly flexible and economic optimized antenna manufacturing processes for large-scale production down to batch size of 1 antenna.

**Design**

Design of application oriented antenna (monopoles, dipoles, patches, arrays, …)

**Simulation**

- Employing simulation tools: CST Studio Suite™ [Microwave Studio]
- True-to-scale representation of complex antennas and its application environment
- Simulation of the antenna properties (scattering parameters, VSWR, wave impedance, 3D-directivity, …)

**Manufacturing**

- R2R screen and gravure printing, sheet-to-sheet and R2R inkjet printing
- Printing on different rigid and flexible substrates; polymers [PET, PEN, …], papers, textiles, sheet metal

**Characterization**

- Measurement of the antenna properties (scattering parameter, VSWR, wave impedance, 3D directivity, …)
- Measurement range: 9 kHz – 6 GHz