In this master’s thesis, practical matching techniques for antennas suitable for cellular phones are studied. At first general parameters of antennas are introduced and the effects of physical properties of an antenna on the parameters are discussed. The simulations and measurements of parameters were carried out with the same simple single-band test antenna structure. The measured results were very congruent with simulation results, which shows that modern simulators are useful in simple designs.

Planar Inverted-F Antenna (PIFA) is chosen for further study from antennas suitable for cellular phones and its basic design is reviewed. Additionally several different methods to implement a multiband PIFA are introduced. Because maintaining the impedance bandwidth of a PIFA in cellular applications is difficult due to the limited volume of the antenna element, the method of active tuning was studied. The key element of the active tuning is an electrical switch. Although the switch itself is important, the work does not concentrate on the switch but on the switching circuit. After introduction of different active tuning methods, the capacitive loading at the open end of a PIFA was chosen for practical measurements. The measurements concentrated on comparing the center frequency shift capability, impedance bandwidth and radiation properties with different loads. The required impedance bandwidths were achieved with all implementations of the component values, but at the expense of vastly degraded radiation efficiency. Depending on the implementation of the prototype the radiation efficiencies were between 10% and 45%.

Keywords: active tuning, bandwidth, PIFA