

## Summary

### Investigation of Sampling Methods in Spherical Near-Field

Spherical near-field measurement required an exorbitant measurement time in order to get a high accuracy of the measurement data. In addition, near-to-far field transformation by fourier expansion was used to get the far-field pattern and it employed regular sampling to acquire the samples. However, the regular sampling leads us to the oversampling problem on the spherical pole. Hence, the solution based on the uniformly distributed sample points and low measurement samples have to be observed to overcome the oversampling and reducing measurement time. In this thesis, matrix solution in the near-to-far field transformation was proposed which is possible to apply different sampling patterns. The problem appeared when we wanted to reduce the number of samples in the matrix solution since the matrix became an underdetermined system and could not give an exact solution. Based on this problem, an alternative solution had been proposed which is called compressive sampling.

Compressive sampling worked with a sparsity assumption in the signal and specific property of a basis matrix called restricted isometry property and low coherence. In this thesis, those properties have been explored in spherical near-field measurement system. Furthermore, real measurement data and issue of the computation time were analyzed. The results showed that matrix solution and compressive sampling can be used as solutions for near-to-far field transformation. Moreover, compressive sampling could give a reliable solution in the case of undersampling.